

MILITARY REVIEW



COMMAND AND GENERAL STAFF SCHOOL

FORT LEAVENWORTH, KANSAS



A MONTHLY REVIEW OF MILITARY LITERATURE

COMMAND AND GENERAL STAFF SCHOOL
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Colonel F. M. Barrows, *Field Artillery*, Editor

To All Readers:

Because of the small amount of research which is being done as a result of the war and due to the large amount of material coming to the editorial offices in the form of articles, it has been considered advisable to discontinue the Subject Index as part of the Military Review and devote the space thus saved to more articles in a larger type-face.

The Subject Index will, however, be continued for the use of instructors at the Command and General Staff School, and several mimeographed copies will be kept on file in the Command and General Staff School Library and will be available on loan to libraries or individuals doing research.

The policy regarding book reviews has also been altered. Most military magazines have a good number of reviews in each issue; and rather than make a random choice from the many books coming into the Library, the editors believe it well to pick periodically an outstanding book and give it a critical review in the form of an article. From time to time these reviews will appear in the Main Article Section.

The Editor

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COMMAND AND GENERAL STAFF SCHOOL
**MILITARY
REVIEW**

MONTHLY REVIEW OF MILITARY LITERATURE



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September 1943



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BRIGADIER GENERAL S. C. GODFREY-----	<i>Engineers With the Army Air Forces</i>
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COLONEL W. A. PASHLEY-----	<i>Changes and Scope of the Service Staff Course</i>
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MAJOR H. C. DOZIER-----	<i>Of What Use Is That Box?</i>
MAJOR W. H. EDWARDS-----	<i>An SOP for Summary Courts</i>
MAJOR E. R. ELLIS-----	<i>Ammunition Supply in the Infantry Division</i>

Contents

	<i>Page</i>
THE APPLICATION OF AIR POWER	5
OUTLINE STRATEGIC PLANNING	9
THE ENGINEER AMPHIBIAN COMMAND	13
AIR SUPPORT OF GROUND UNITS IN SOUTH PACIFIC OPERATIONS	25
THE GENERAL STAFF COURSE TODAY	26
CHANGES AND SCOPE OF THE SERVICE STAFF COURSE	28
AMMUNITION SUPPLY IN THE INFANTRY DIVISION	29
AN SOP FOR SUMMARY COURTS	34
REHABILITATION CENTERS	36
ENGINEERS WITH THE ARMY AIR FORCES	39
OF WHAT USE IS THAT BOX?	44
ACTIVITIES OF THE PROVOST MARSHAL GENERAL TRAINING CENTER	47
THE DIVE BOMBER	50
PLANNED ORIENTATION BUILDS MENTAL FITNESS FOR COMBAT	52
AIRBORNE FIELD ARTILLERY	55
WITH A QUARTERMASTER TRUCK COMPANY IN THE MIDDLE EAST	58
IN MEMORIAM—MILITÄR-WOCHENBLATT	60
FOREIGN MILITARY DIGESTS	61
<i>Tank Battle in Tunisia</i>	61
<i>Land-Air Technique in Africa</i>	63
<i>Bridgeheads</i>	65
<i>Help for the Neighbor in Combat</i>	66
<i>Forgotten Man of the Bridgehead</i>	67
<i>Russian Defensive Tactical Developments</i>	69
<i>Tank Action at Night</i>	70
<i>Germany's Atlantic Bases</i>	71
<i>Attack on the Flanks</i>	74
<i>Attack on a German Center of Resistance</i>	75
<i>The Army Pigeon</i>	77
<i>The War Against Guerrilla Fighters</i>	79
<i>The Guard on the Island of Rhodes</i>	80
<i>Antitank</i>	82
<i>Employment of Artillery in the Mountains</i>	83
<i>Skilful Use of Infantry Fire</i>	86
<i>Developments In Tank Warfare</i>	87
<i>Fighting in Burma</i>	88
<i>A Duel With a Soviet Tank</i>	89
<i>Debarkation and Engagement of a Naval Landing Party</i>	90
MILITARY NOTES AROUND THE WORLD	93

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The Application of Air Power

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THE REAL SUBJECT of this discussion is not Air Power but Air Force. The two terms are not synonymous.

Air Power embraces the entire air problem including commercial and private air activities as well as the military aspects. It includes the factories, the airlines, and the private flyers, while Air Force is but one part made possible by the others.

Air Force is only that part of the national Air Power which is devoted to military operations—strategic, logistic, and tactical. This, of course, is the part which is of paramount interest today, and therefore it is the only part under discussion.

Air Force is not a simple subject for discussion and it is the more difficult because of its comparatively recent birth. Implementation of an Air Force demands a clear conception of the functions which it is to perform. An Air Force may include many categories of special aircraft. As between them there is a good measure of flexibility as to employment. This measure of flexibility must not, however, confuse the issue of demanded superior performance of each type in its own specialty. As you well know, airplane design involves many compromises—a single design cannot excel in everything.

Air Power revolutionizes in many respects, but does not necessarily outmode, old concepts of warfare. It lengthens our reach, ignores obstacles which deny movement to surface forces, increases the distance over which we can strike and the speed with which the blow can be delivered, but it does not change the basic principles of warfare.

Surface warfare must attempt to crush the resistance which guards the approach to the enemy's vitals. There are armed forces except where mountains or oceans can be made to serve. The armed forces may be attacked directly—but it is usual to attempt to deny reinforcements and supplies to the enemy on the battlefield. It has always been recognized that the killing of armed men is one means of attaining victory. It is also generally understood that much of the enemy ability to resist can be voided by interdiction of his supply channels.

Any army which is isolated from supplies and reinforcements soon becomes inert. Thus we see the effectiveness and economy of the single and double envelopment or encirclement as against the frontal attack.

Air Force increases the scope or possibilities along those same lines. It enables us to assist our front line forces by hitting the enemy in the immediate fore-

front and just behind his lines, attacking his supply dumps, his roads, and his strong points in much the same manner as ground artillery. But it is not so limited in range as is artillery, to which it bears some similarity. The airplane can reach much farther into the interior of the enemy territory to deliver destructive blows on the vital sources far beyond the range of the most powerful ground gun.

When the enemy occupies territory which is, to all practical purposes, self-sustaining, the destructive power of Air Force is of the greatest importance. Air Power now permits the seige of a relatively self-sufficient nation, an internal siege that prevents the supply flow from inside sources to the fighting fronts. The possibilities of this internal blockade are no less real and apparent than are those of an encircling blockade which eventually so weakens an enemy that his circumference of defense is unable to put up effective resistance against frontal assault. Disintegration of defense, such as occurred recently in Tunisia, is but a logical consequence.

This thought points the finger directly at the outstanding capability of Air Force. It singles out the long range bomber as the weapon which enables Air Power to serve as a primary instead of an auxiliary arm. It may still be necessary to hold and strike the enemy on his front lines by every means at our disposal on land, on the sea, and in the air, but the internal blockade made possible by the long range bomber can be used independently to hasten the weakening of enemy resistance and to reduce the ultimate cost of the final assault. It is, on a big scale, a vertical envelopment for denial of supplies, munitions, and equipment to the enemy's fighting forces.

It is not necessary to belittle the importance of the ground support capabilities of Air Force. These have often been demonstrated. The North African campaigns, the one from the east as well as the one from the west, which finally merged into the combined battle for Tunisia, were classic examples of the use of fighters and bombers in direct support of ground forces. Rommel's long line of communications, and his port, became a shambles through which supplies passed only at great cost. In Tunisia our fighters and light bombers raised havoc with tanks, trucks, and marching troops, while the supply dumps and troop concentrations never had a moment of safety.

But too often we have let the most obvious facts blind us to more fundamental lessons. Air superiority in the battle area was spectacular and complete, but it was not an end within itself. Air superiority per-

mitted the fighter-bombers and the other planes to have almost free reign over the battle area, but that is not always enough. Last spring and summer the RAF maintained superiority over the German Air Force in Libya and Egypt, but though this helped considerably, it was not enough to prevent the German advance to the edge of Alexandria. There was something missing.

Studying the later African campaign, we see the piece that was missing and we can identify it as strategic bombing, the air action which prevented the delivery of essentials to the African area. A regiment of tanks operating on suitable terrain is a powerful unit. Many lives and much equipment is the usual cost of destroying one belonging to the enemy. To destroy it while aboard ship by a few aerial bombs—sunk without a trace—is very welcome direct support to the ground force which would otherwise meet it on land. The Bismarck Sea action was a classic example.

We can go back as far as March, 1942, for an example of air action which, beyond all doubt, contributed to the reasons why German defenses disintegrated so completely. It has been estimated that the RAF's attack on the French Renault plant in March, 1942, denied the German Army the equivalent of the heavy transport needed for over two and one-half divisions. To do the same on the battlefield would have cost untold hundreds in casualties, but the RAF paid only a few airplanes and crews. Bombing of steel mills, refineries, and other industrial units in Europe by the American Eighth Air Force and the RAF further weakened the flow of support to the German forces in Africa as well as elsewhere, while the British and American attacks on Axis Mediterranean ports made them almost useless. Allied fighter interceptions of huge Axis air transport fleets contributed directly to the blockade, while the Axis needs for air protection against Allied air attacks over the continent cost many fighters and prevented adequate reinforcement of the dying Axis air force in Africa.

All in all, the Tunisian action was a beautiful example of coordination of all forces to attain final victory. Each served in its proper place. The campaign will live in history largely because its termination provides a convincing example of the effects of strategic bombing. Frontal assaults upon such a powerful enemy could succeed only in causing him to withdraw, except where a breakthrough might permit encirclement of certain forces. Instead of that common result, the German defense disintegrated spectacularly, as from interior decay. Individual units were still intact, yet they wandered around looking for Allied forces to whom to surrender. They could no longer fight as a complete army.

Many who argue against the value of Air Power, use the Battle of Britain for what they consider proof positive of the futility of strategic bombing.

No one questions the numerical supremacy of the German Air Force at that time, and no one can deny that it was used with devastating ruthlessness. Yet it certainly failed to bring England to her knees or even to wavering in her determination to keep fighting. Neither did it materially impair her industrial production.

But I would submit that the German failure in the Battle of Britain was the result of earlier misconceptions of the possibilities and limitations of Air Force, rather than a failure of the force itself. They did not design or plan correctly for that part of their conquest.

Action in Poland, Norway, Holland, and France indicated that the German blitz technique allowed no place for the slower process of internal decay which results from real strategic bombing. The classic one-two-three cadence was in her crushing blows directly against the enemy defenses, and her overwhelming superiority enabled her to drive through. She designed her airplanes with that in mind, and her initial success speaks for itself.

But the German concept of Air Force was too limited. It contemplated the use of airplanes for only three basic purposes:

- a. To attack enemy surface forces at and near the line of contact
- b. To transport men and equipment, sometimes well behind enemy lines
- c. To defend their own forces and territory from similar air operations of the enemy.

This worked beautifully until Germany tried to use the same weapon, one designed and trained for tactical use, in an all-out strategic attack upon a major nation. She visualized strategic bombing of Britain as being the same as the helter-skelter bombing and strafing of front line forces. She thought that she would smother England under a rain of bombs so solidly that the traditional English will would be broken along with British industrial might. The idea was there, but the method was wrong.

As Mr. Churchill said, in effect, in a paper on Air Power written in 1917, nothing that we know about warfare can lead us to believe that bombing for terror alone can cause such a morale collapse as to force a major nation to sue for peace. He said that Air Power must single out and attack transportation, factories, and other enemy installations upon which the enemy war-making ability depends. England of 1943 is living proof of the truth of the first part of that statement, and the Allies are now proving the remainder.

But Germany obviously did not realize the full implications of Mr. Churchill's remarks. She did not visualize the singling out of industrial units as being a refined process. Certainly if she had been using super-long-range cannon to deliver the projectiles, German tacticians would have insisted, in the interest

THE APPLICATION OF AIR POWER

of efficiency, that the guns be aimed at specific factories, docks, and other vitals. Instead of visualizing the airplane and its bomb load as being finite quantities, she seemed to consider them as capable of covering England with a solid blanket of fire and explosive, thereby insuring the destruction of all British industrial vitals.

But even in the relatively small area of Britain, industry is not concentrated when we measure distance in terms of bombs required for solid coverage by relatively unaimed bombs. The space occupied by a machine shop is very small compared to the space filled by the homes of the men required to operate the shop. Then when we consider the immense additional city area having little if any connection with the machine shop we begin to realize the reason why Hitler's blitz of cities by scatter-bombing failed to destroy the vitals or even to impair them very seriously.

That, of course, is said without any desire to detract from the magnificent defense put up by the outnumbered RAF. Only history can bring out the full glory of that small, heroic force. But we cannot get away from the fact that when strategy and efficiency called for precision, Germany bombed for terror with unaimed bombs and hoped in vain that chance would aid in hitting vital points.

The lesson is now written in history for all to heed, but without making any pretense to omniscience, the American Air Forces have long had that idea as a basis for their planning of equipment and technique. Efficiency expressed in the military maxim "economy of effort" is an epitome of the air concept upon which we have based all of our efforts, and this is best attained in strategic bombing by scientific target selection and precise placement of bombs where they will do the most real damage.

This demands a complete analysis of enemy industry to determine the relative importance of each type of industry, and then the relative importance and vulnerability of each unit of the selected industries. Cities, as such, are not considered though many units of industry within a particular city may be singled out as requiring destruction.

Such an analysis results in the discovery that a relatively small percentage of the many hundreds of industrial units need be destroyed in order to ruin the enemy's ability to wage war on modern terms. But even then we cannot be prodigal with our force. If we were using cannon, as I said before, we certainly would aim carefully, and we cannot fail to realize that a bomb is essentially the same as a shell fired horizontally at the speed of the airplane. No matter what our potential wealth may be, we still must measure it in finite terms, and our weapons will always be counted in finite figures. Therefore, we must exert every effort to be as economical as conditions permit. Destroy the targets but do it efficiently

with a minimum waste and in the shortest possible time. Precision bombing does this.

Aimed fire is considered essential in the infantry when individual soldiers may be armed with an eighty-dollar thirty-caliber rifle. We have paid bonuses for many years to encourage quality, develop expert riflemen and sharpshooters. The necessity for precision bombing should be fully as obvious.

The enemy war machine—and it is a machine—is analogous to an automobile which we want to prevent from running. It is parked at the curb and entirely within our reach. Would we take an axe and start chopping and pounding until we beat it to a pulp? Or would we merely take out and hide the rotating contact in the ignition distributor?

Another analogy is in the old story that "for want of a nail, the battle was lost." We take away the nail.

More specifically, we might point out that, though we can stop a tank by killing its occupants, suffering casualties on our side while doing this, would it not be more economical to destroy the potential tank by taking away the lathe used in its construction? Strategic bombing has that for its initial objective.

Many volumes could be written about Air Power as we visualize it, but like Sea Power, it cannot be described within the limitations of any one of its phases. It must always be composed of separate types for various functions, each necessary if it is to fulfil its purpose. Fighters are necessary for defense and for attaining air superiority. Medium and light bombers are vital factors in direct support of surface forces, and the longer-range medium bombers also serve in the strategic effort farther to the enemy's rear. But Air Force reaches its peak expression in the heavy, long-range bombers which are the only weapons capable of hitting the real sources of mechanized military power.

Properly employed, a well-integrated Air Force serves to decrease the time, as well as the cost in life and wealth, of the final victory. To determine the proper sequence of operations, let us attempt to visualize the ground-force-requirements and potential losses involved in the invasion and final subjugation of the enemy.

With no strategic bombing, it is readily apparent that the initial ground-force-requirement is very high. World War I statistics show that casualties will also be very high. Killed, wounded, and missing involve nearly 50% of those committed.

Before invading, let us start a scientific program of strategic bombing of enemy industry.

At first we will make shallow penetrations, striking primarily at targets which will reduce the air defense power of the enemy—hitting aircraft factories and flying fields, and knocking down fighters.

Other targets on our schedule also will be hit, but

there will be nothing spectacular about the process. Little or no effect will be seen in the front lines, and an invasion started during this period would require the same strength and experience the same losses as if no strategic bombing had been done.

The second phase starts when we have gained the edge over the enemy's production of airplanes for defense, when he is no longer able to increase his defenses, and when we can stand the losses of deeper penetrations. Our bomber force must be larger here and steadily growing throughout this period which will end when the effectiveness of the enemy defenses is definitely on the down grade.

Again there will generally be but little evidence in the front lines of the real effect of strategic bombing. The internal decay will be well under way, but production is normally so far ahead of war use that only isolated evidences of shortages will be noticeable. Thus during this period there will be but little lowering of the ground force requirements and losses in case of invasion.

Now we start the third phase in which we really get down to the business of knocking out the heart of enemy production capacity. But it is still not spectacular. A chemical plant shattered here, an airplane factory flattened there, and a synthetic oil plant in flames. That is the sort of thing you see in the daily communiques.

And if you looked down on the whole face of Europe as on a map, you would see little to attract attention. Tiny puffs of smoke and flame where precision bombing was doing its pin-pointing of enemy vitals like a skilful surgeon removing a tumor from a vital organ. But in this case, the work is to create the cancer in the enemy vitals—to cause the internal decay—eventually leaving but a shell similar to a pie crust which crumbles away when punched even gently.

During this third phase we really begin to realize dividends. The effects of previous bombings will begin to be felt by front-line forces, so that an invasion started late in this period will require much less force and will experience considerably less loss. However, if time permits, it should not be attempted while there are prospects of further reducing forces required and losses to be expected.

The fourth and last phase starts when we have completed the initial destruction of the selected vitals and have started the cleaning up process on items overlooked. We will also have to destroy a few units which have been built from the ruins of earlier destruction, keeping a sharp watch to see that new sources are not left untouched.

No matter how long this finite bombing continues, it cannot completely eliminate the necessity for occupation and final subjugation, and there is a minimum force which must be used even if there is no opposition. Also, it is not possible to take away all

of the arms which may be on hand and there will always be casualties in an invasion force.

The invasion should start when to delay longer would waste effort but when its cost has been reduced to a minimum. Of course, it is not a matter of following a precise time table, but, measured in months, it is almost so. Faith and understanding are the essential requisites—faith in the theory behind strategic bombing and understanding of its limitations and uses.

In conclusion, we might point out certain special features of the American concept of Air Force, and particularly of our idea of strategic bombing, which tend to lift Air Power from the depths of Axis brutality.

In the first place, we hope and fully expect to prevent most of the enormous losses which would be suffered on our side without this bombing, a saving besides which the most severe air losses will be infinitesimal. Next, the result of precision is efficiency measured in economy of effort, allowing the forces available to accomplish the task with minimum waste and in the shortest possible time.

Another less tangible consideration, but one which cannot be ignored, is the post-war attitude of the nations toward each other. Bombing at its best cannot fail to cause some extraneous destruction and must certainly make the war and its hates very real to victim populations. Carelessness on our part would intensify and spread those hates which would be stumbling blocks to international peace for years after the actual fighting is over. Precision will hasten the time of new understanding.

Finally, we must recognize that post-war economy is intimately related to the manner in which bombing targets are selected and attacked. Due to the fact that modern communications have tied all peoples of the world as close to each other as were the original colonies from which this nation was formed, the standard of living of one nation must hereafter be definitely affected by that of any other. There must be a leveling off.

In order to prevent a serious reduction in our own standard, we must assist in the rebuilding of every other nation, enemy or ally. Therefore, aside from the necessity for economy of effort in winning the war, we have a very potent urge to defeat the enemy without causing any but the most unavoidable amount of extraneous destruction.

These are the basic principles of our air war doctrines. Naturally they are the ideals, and due to human frailties and the elements of chance, we never attain the ideal.

By shooting for the maximum goal we certainly will tend to approach it, and the Army Air Forces will never cease to exert itself along these lines. Efficiency and savings in the over-all cost in blood will be our constant objective.

Outline Strategic Planning

LIEUTENANT COLONEL WILLIAM H. BAUMER, JR., *General Staff Corps*

GLOBAL warfare has increased the need for broad strategic planning. When wars were fought in a single combat theater, the commander in the field was able to plan his campaign for the defeat of the enemy certain that all available national resources would be furnished him. Since the major battles were confined to one area, the Chief of Staff in Washington exercised only general control of future operations, leaving the planning task to the commander of the field forces.

Today the requirements for the many operations carried out in numerous theaters of war must be weighed in the light of the global decisions of the interested chiefs of staff. Between the theater and task force commanders and the Chief of Staff is the War Department General Staff. According to Field Service Regulations, the Staff must make an "accurate and sound estimate of the means necessary to accomplish a desired objective." The preparation of outline strategic plans is thus required of the Staff.

Planning is expanded or reduced in scope according to the definition of "strategy." In the broadest sense, strategy follows the Clausewitz formula of employing battles to gain the objects of war; in its narrowest sense, it is the "art of the general" on the battlefield. Overall, or grand, strategy is formulated by the United Nations' Combined Chiefs of Staff; battlefield strategy by the interested task force commanders. The latter, pursuant to directive, may be charged with the making of plans for combat operations. Linking the extremes in strategic planning is the duty of the General Staff. Not only does the Staff project the grand strategy of its leaders but also utilizes the advice and assistance of the various theater and task force commanders in outlining its strategic plans.

An outline plan for a contemplated operation follows a general pattern, subject to changes in sequence and manner of presentation for each different problem. First, the mission of the operation must be clear-cut and consonant with the broad strategy laid down by the military leaders. Like the succinct and positive statement of mission to the company or platoon commander, the mission assigned in the outline plan must also be a statement of the commander's task. The latter may, for instance, be directed to seize and occupy an island in order that it may be used as a base for future invasions.

In accordance with Field Service Regulations, the Staff's outline plans "must ordinarily view in their broader aspects the contemplated operations, terrain, lines of communication, enemy forces, and

the dispositions of friendly troops and logistical arrangements." However, the Staff's study of an envisaged strategic move against the Axis is necessarily conditioned by the situation calculated to be in existence at a time one or more campaigns later.

As a basis for planning, a list of reasoned assumptions is the first essential. While strategic in character, they must take into primary account the military position of the Axis and of our own and allied forces throughout the world at the projected target date. Also of significance are possible changes in the status of neutrals. Furthermore, assumptions on the capabilities of production and of the transportation of military resources to the theater of operations will have a formidable bearing upon United Nations' abilities in the amphibious warfare to which we are now committed.

After setting up a series of assumptions, the planners will view the combat area, taking into account all the geographical and natural factors influencing the operation. The broad photograph of the area reveals the extent of the relative land and sea masses, the proximity of the staging ports and of the land and sea locations flanking the line of approach to the target site. The combat zone may be mountain or rolling hills, jungle or open country.

Terrain is the one immutable factor in war. Just as Scipio Africanus in 202 B.C. chose the battlefield at Zama in Tunisia where he would oppose Hannibal, so too does the modern commander after surveying his infantry, armored and air power, and the logistical situation, select a favorable time and place for battle. America's fighting in Africa, Melanesia, and the Aleutians has been conditioned to date by the first requirement that the forces make a landing. In every case we have so far met the enemy in his own bastion, though in launching the operations we have selected our own landing sites. This necessitates complete study of the coastline, with special attention paid to rocky ridges as well as to the sandy beaches. Tides, depth of water off-shore, shelving of the beach, and other hydrographic factors are considered in planning an amphibious landing. In order to gain tactical, if not strategic, surprise American forces may have to storm beaches which are something less than the finest available.

The planner of future operations must search for the routes inland from the shore. Naturally routes of approach through lowlands are more favorable than through corridors between Axis-defended ridges. The terrain ashore should aid the attacker, once he has attained a lodgement. Therefore good beaches backed

by routes of egress inland, with flat or rolling terrain favorable for mechanized and motorized action and suitable for the installation of airfields are sought by the planner.

Similarly weather should be used to assist the assaulting force. American forces will not necessarily choose the season of best weather when visibility is good and storms few in number, but will weigh all factors. Off-seasoned weather may be utilized for operations by the assaulter in an attempt to attain surprise. Our surface fleets may seek to move into a landing during the climax of a period of bad weather, using the clearing days for the follow-up operations when good weather may assist the ground and air operations. Poor visibility may likewise be desirable for the landing of ground forces, though at the sacrifice of air cover. Ill wind and weather may thus blow the landing force some good, allowing them to consolidate their position in a beachhead. Naturally in many climes the possibilities of ground, sea, and air operations are nil during the seasons of the worst storms, whether they be wind, snow, rain, or sand.

The most detailed knowledge of weather and climate are necessary for the planner. Periods of daylight and dark affect operations. Even the moonlight and moonless periods attract the commander as they do the lover. Moonlight is preferred for the accomplishment of certain tasks; the cover of complete darkness for others.

Having surveyed the beaches and landing places, the planner must obtain intelligence of coastal defenses, antiaircraft defenses, and heavily defended zones. Oftentimes the best beaches are covered by the strongest defenses. The advantages of the landing site must be balanced against the disadvantages entailed in a strong defense system. It is certain that the Axis powers in Europe and Asia cannot protect thousands of miles of coastline with strong defenses.

Other than the physiography and beach defenses, many other installations and conditions may affect the contemplated operation. The presence of possible air landing grounds, of first-class air- and seaplane bases is important. Present-day operations depend largely on obtaining astronomical amounts of supplies. A good port is desirable, if not a necessity. The possession of ports whose daily capacity and installations are known is an asset to a landing force. Naval facilities, such as a good anchoring ground and a supply and repair site, are also desirable for the surface forces.

On land, road and rail nets must be carefully studied by planners. The daily capacities are important to attacker and defender alike. The numbers of the bridges, tunnels, trestles, and main road and rail centers must be considered in an outline plan. Similarly telephone and radio networks should be plotted.

One of the vital factors affecting contemplated operation is the health conditions in the area selected

for action. Precautions are always taken against disease but in some areas they cannot be completely controlled.

Knowing the terrain and its complexities, the installations and conditions which will affect an envisaged campaign, the outline plan should next appraise the balance between the opposing forces. The capabilities of American forces can be calculated; those of the Axis must be evaluated from available intelligence.

The enemy's capabilities on land, sea, and in the air must be carefully estimated. The numbers and types of air, ground, and naval forces must be totaled; the character and morale of the troops, their capabilities of movement into the critical area—all these and other factors require study. Axis capabilities are then analyzed in the light of the assumptions made. If, for instance, the campaign is planned for six months hence, the assumptions may place the Axis forces in such position that he is able to divert only a minor portion of his strategic reserve to meet the contemplated United Nations' operation. Consideration of Axis capabilities thus gives an additional check on the reason and logic in the assumptions upon which the outline plan is built.

Logistical considerations have the same sobering effect on Axis forces as on our own. However, since movement is on land and within Fortress Europe, his capabilities are calculated after a study of the capacity for road and rail transport. In Asia land and sea communications are analyzed. Axis ground and naval forces cannot be moved in the flick of an eyelash; nor, contrary to popular belief, can his air forces. Granted that in some special cases Axis combat aircraft are able to tow their ground crews in gliders, there are many more requirements for the full-scale operation of a combat air force. Supplies for the air forces must be moved in large part by rail and water; airfield installations must be built, or restored to complete operation. Unless duplicate installations await the air force upon its arrival in the area of operations, the Axis air forces are balked until their logistical setup catches up with them.

Balanced against the estimated capabilities of the Axis to move ground, air, and naval forces into a potential combat area must be an appraisal of the capabilities of our own force. Admittedly an assault is complicated if water is to be crossed and beaches stormed. Assault shipping and landing craft must be gathered from our production centers, dispatched overseas, and delivered in proper numbers and in sufficient time for the training and eventual employment by a landing force.

Balancing Axis forces, both offensive and defensive, by sufficient United Nations' forces presents a problem complicated by the size, strength, and fighting qualities of the Axis troops. Moreover, our own "strength-of-forces" equation contains variable factors such as the type and training, and logistical sup-

OUTLINE STRATEGIC PLANNING

port of troops scheduled to fight in extremely varied terrain.

The General Staff's estimate of the forces required for the task is usually computed in an overall number of divisions, divided into corps and field armies. Percentage factors for the computation of the combat support and service forces under differing conditions will determine their numbers close enough for broad outline planning. Subsequent detailed planning by the theater or task force commander will give the exact composition of the series of assault echelons, and the requisite service units for their logistical support.

The air forces are organized broadly in numbers of groups to provide, if possible, land-based fighter cover and to round out both tactical and strategic air forces. Integral air-service units are added according to requirements dictated by experience in related combat theaters.

Naval forces required for the convoying of the forces to the combat location and for the covering of the landing in proportion relative to the enemy naval capabilities are then computed.

From a general background knowledge of the expected dispositions of the Axis forces, of the terrain, of lines of communication and logistics, a concise statement of the problem confronting the Allied Nations is developed. Positively indicated, it is a synopsis of the task the commander is to be directed to accomplish. The statement outlines the commander's task, but does not tell him how to do it.

Developing from a consideration of all the factors above, a concept of operations is formulated. This portion of an outline plan, usually divided into phases, will inevitably take into cognizance the landing on hostile shores, the expansion of the assault into the beachhead or lodgement area, and the follow-up advance along the avenues of approach to Axis strategic centers. This concept of operations is necessarily colored by all the other aspects of the strategic plan.

In entering Axis-conquered or Axis territory, political and economical factors which affect military operations must be considered realistically. The tenor of the people's feelings, aid to be expected from them, overall disadvantages to our forces—these and many more factors are tossed into the scales of the contemplated operation. Rarely if ever a determining factor, political and economic considerations affecting the military campaign must nevertheless be appraised by the General Staff.

Outline strategic plans are made realistic by the careful calculation of the logistical factors contributing to success. Certainly the statement that the key to strategy is logistics is truer today than in any past war.

In former wars the commander needed only to select the ground upon which he desired combat. His

forces marching by foot lived off the country enroute to battle. Today one of the critical problems of warfare is the transportation of armed forces to battle, and the furnishing of their fighting needs once present in the combat area. However, the science of strategy known as logistics, from the French *loger* (to lodge), is much more complicated than mere transportation and supply of the field armies. More than food and fuel, supply embraces "the function of placing at the commander's disposal, in proper quantities, at the proper place and at the proper time, all that he requires for the maintenance of his force."

The implications of supply are universal. Shipping, port capacities, roads, railroads, air and naval bases, and communication networks are some of the multiple considerations which in their use constitute what is known as logistics. Staff officers dealing with logistics point out the mathematical meaning of the word and show how the gremlins of computation plague them when projecting operations well into the future. Shipping estimates for instance are always fluid.

The availability of shipping for amphibious operations and the capability of moving military supplies through ports and over the beaches determines in part the composition of the task force. In order to place the maximum number of men in contact with the Axis troops, it is necessary to supply the combat echelons. Seven to ten tons per man initially and one ton per month maintenance are the figures usually given in the press for the supply of a task force. How the immense tonnages will be transported and of what they will be composed is a decision determined in large part by logistics. In order to bring a combined fighting force into contact with the Axis, the commander may have to sacrifice a number of tanks and fighting men in order that he may bring in bulldozers for the clearing and leveling of an airfield. Material and equipment for the repair of a port may be requisite for the build-up of an assaulting force in their lodgement area ashore. Railroad equipment, trucking, and heavy ship machines for repair may conceivably compete with fighting men for space in early convoys.

These and other logistical considerations must be analyzed by the outline planner as he plans the phases of a contemplated operation. The modern-day commander and planner is faced with the necessity of striking a watch-spring balance between combat and logistical factors. Mechanized armies, finely tuned as they are, are dependent to an inordinate degree on the maintenance and repair equipment which must be brought in close behind the assaulting wave.

Our own pre-invasion air bombardment when coupled with the possibilities of Axis destruction or removal of railroad rolling stock, and with the expectation that the Axis has placed demolitions along bridges, tunnels, docks, and canal locks, adds to the

logistical problems to be considered in an outline plan. The logistical problems mentioned above are only a few of those confronting any strategic move. The logistics of a contemplated operation are critical factors and tend to underline the statement that logistics are the key to strategy.

Having thus analyzed the many factors affecting a future operation, and having developed a complete picture, the outline planner must re-appraise his concept of operations and check his material against the mission assigned in the statement of the problem. The entire study must be neither too conservative nor too optimistic. Though the momentum of operations may require bold use of the initiative, it will not justify poorly conceived strategy. Unlike tactics where a relatively poor plan may achieve success through brilliant execution, strategic operations will not attain success if developed contrary to the principles emphasized in the foregoing pattern of outline planning.

Though the General Staff has thus viewed a contemplated operation in an outline strategic plan, it is axiomatic that the plan is no more than the best estimate which the available facts warrant. Changed assumptions, new estimates of the capabilities of the Axis, and new facts about our own forces make the outline plan constantly fluid. From its general outline plans for contemplated global operations, the War Department General Staff is able to advise on the grand strategy and also to appraise realistically the individual theater commander's plans for future operations.

The responsibility of the General Staff for the preparation of broad basic plans of campaign is a continual one. When the theater or task force commander has accomplished his detailed operational plans and has initiated the assault, the Staff is projecting its plans, as the Field Service Regulations demand, at least "one campaign ahead."

Clausewitz on Russia

Possibly, if the German General Staff had encouraged the reading of the later works of Clausewitz—those written after he had taken part as a Russian officer in the war of 1812 and as a German officer in the Waterloo campaign—German political leaders might have found a passage which would have modified the triumphant smile with which they announced initial German victories in Russia.

"Russia by the campaign of 1812 has taught us first that an empire of great dimensions is not to be conquered. Secondly, that probability of [an invaded nation's] final success does not diminish in the same measure as battles, capitals, and provinces are lost, but that a nation [on the defensive] is often strongest in the heart of a country if the [invading] enemy's offensive power has exhausted itself."

Colonel J. R. Kennedy in *The Fighting Forces*
June 1943

The Engineer Amphibian Command

COLONEL ARTHUR G. TRUDEAU, G.S.C., *Chief of Staff*

SINCE this article was prepared, amphibious operations in the Mediterranean and the Southwest Pacific have been launched. While most assaults were of the ship-to-shore variety, shore-to-shore operations with larger type landing craft played an important part in the landing on Sicily. Operations at Nassau Bay in New Guinea on 30 June and at San Agata and Cape Orlando behind the German north flank in Sicily in August, however, are noteworthy in that they represent the first American attempts to apply the outflanking tactics suggested by the author. All were successful. The landing at Nassau Bay by Amphibian Engineers and combat elements effected an advance of more than 50 miles in one night and contributed directly to the fall of Mubo a few days later. The landings in Northern Sicily caught the Germans by surprise and forced rapid withdrawals of their northern flank anchored on the sea.—THE EDITOR.

Water areas adjacent to shore lines or between islands must be turned into avenues of approach and routes of communication instead of still being considered as obstacles. In a war where mobility is a prime factor, we have closed our eyes to one important means of getting it and continue to let troops make frontal attacks at almost imperceptible gains when we should be striking swiftly, and in mass, at the enemy's rear. Boats should be considered merely as vehicles adapted to movement over unimprovable ocean highways and teamed with other elements necessary for success in this special type of operations.—THE AUTHOR.

AS THIS ARTICLE is being written, the Engineer Amphibian Command is rounding out its first year. It has been a year of great progress, but even today, no element of our armed forces is so little known or is less understood. This is due primarily to restrictions surrounding its activities. Now that such restrictions have been lightened, I will try to draw a picture of this command along broad lines.

When it was decided that the Army would "train boat crews" for possible amphibious operations, the task was assigned to the Army Service Forces inasmuch as the problem was considered basically one of transportation and supply.

For a hundred years the Corps of Engineers has been in the forefront in the use of waterways as arteries of communication and movement. This work has entailed the use of many thousand small boats. Hence, it was quite logical that one more function should be added to the military duties of that branch. Under Brigadier General Daniel Noce as Commanding General and the author as Chief of Staff, the concept of shore-to-shore movement was developed along these lines:

a. The basic boat unit should carry all the combat elements of a battalion landing team simultaneously.

b. Successive echelons should be established to transport regimental landing forces and divisions.

c. Any success would revolve about adequate control and rapid clearance of the far shore; hence, shore units.

d. Service units for medical, quartermaster, signal, ordnance, and boat maintenance purposes were essential.

e. All of the above should be closely integrated, highly-trained units.

The soundness of these ideas evoked general approval, and tables for Engineer Amphibian Brigades were prepared and approved in less than thirty days; in fact, the 1st and 2d Brigades were activated exactly thirty days after General Noce's arrival in Washington. It is interesting to note that new tables just published alter the strength of these original brigades by less than one percent.

MISSION

The mission of engineer amphibian troops is four-fold in extent:

a. *Water transport.*—To transport combat units from one shore to another within the range of its landing craft. The crossing may be from one mainland or island to another mainland or island, or it may be from one point of land to another point on the same land merely using the sea as a highway. It could also apply to the crossing of a wide river or estuary. The far shore may be in friendly hands, in hostile hands, or even unoccupied. Landing operations can seldom, if ever, be justified against a strongly-held enemy shore except as a feint to screen the main effort.

b. *Organization of the Far Shore.*—Beaches secured during landing operations must be developed and coordinated to facilitate the movement inland of troops and supplies. This involves clearing and marking of beaches, removal and demolition of obstacles, salvage, road building, traffic control, establishment

MILITARY REVIEW

of initial dumps and movement of supplies thereto, local defense, etc.

c. *Evacuation*.—The evacuation of casualties, prisoners, personnel, and equipment is an important function.

d. *Re-supply*.—This term includes the movement of additional troops and supplies after the initial crossing, and the continuance of far-shore operations until ports and docks are available and manned by other troops.

Needless to say, such an organization has great possibilities for other engineer work. When there is no combat mission, troops and supplies can be moved about, utilities can be operated, air fields can be built, boat units can be assigned antiaircraft missions, shore battalions can function as combat engineers, or infantry and service elements can all be utilized to advantage.

ORGANIZATION

Experience has shown that an assault on an enemy shore is usually most effective when attacks are delivered simultaneously on several different beaches or at time intervals arranged so as to confuse the defenders, to pin them to the ground or to cause the movement of their reserves away from the point at which the principal landing is planned. The utmost flexibility is imperative.

Each Engineer Amphibian Brigade contains three identical regiments, each composed of one boat battalion and one shore battalion (see Figure 1).

Each boat battalion is divisible into three identical boat companies, each shore battalion into three shore

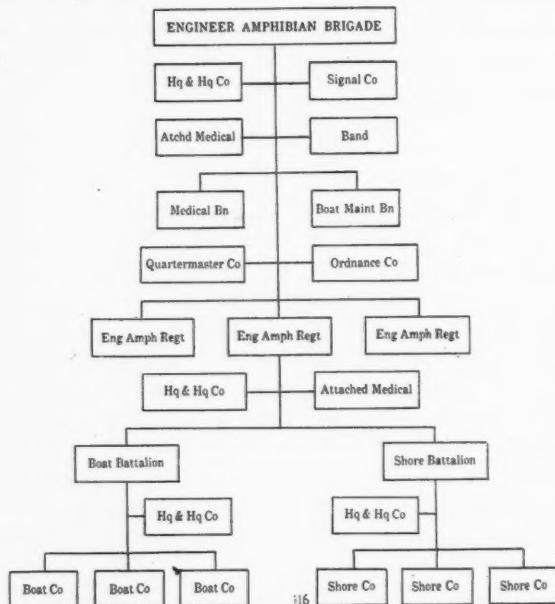


FIGURE 1.

companies. It is usual to refer to the three boat companies as A, B, and C, and the three shore companies as D, E, and F.

This divisibility into self-contained units is a fundamental premise of Engineer Amphibian Brigade organization. *Each unit is scaled to support a standard ground force combat unit*:

a. A combination of *any one* boat company plus *any one* shore company (plus necessary regiment and/or brigade elements) can transport and supply far-shore facilities for a *battalion landing group*.

b. An Engineer Amphibian Regiment (with necessary brigade elements) can transport and supply far-shore facilities for three battalion landing groups or, with naval support, for a *regimental landing force*.

c. An Engineer Amphibian Brigade can, in itself, transport and supply far-shore facilities for nine battalion landing groups and will normally operate with sufficient naval support or auxiliary vessels to provide for all elements of an *entire division*.

The medical battalion has three identical companies. Each supports one infantry-amphibian regimental team. In addition to casualty problems on the far shore, the problems encountered in evacuating and treating wounded personnel in comparatively small boats at sea are unique.

The boat maintenance battalion is charged with 3d and 4th echelon maintenance. It also has three companies, plus a headquarters. It is a vital part of the organization.

Communication and navigation are the key to command and control. The former function belongs to the signal company. It is regretted that circumstances prevent a discussion of this fascinating aspect of amphibious operations.

Brigade quartermaster units encounter a real supply problem in transporting fuel and lubricants for landing craft and other units of vehicular and construction equipment, to say nothing of rations, ammunition, etc.

All landing craft are equipped with machine guns. Shore units have crew-served weapons for defense. These, coupled with instrument and motor maintenance requirements, utilize the ordnance company to the fullest extent.

Before leaving the subject, let us consider the Brigade Headquarters and Headquarters Company briefly. The Headquarters Company, as the name implies, contains the personnel necessary to administer the brigade and assist the brigade headquarters staff. The Brigade Headquarters itself consists of a unit and a special staff. The unit staff performs the normal functions of administration, intelligence, operations, and supply. These activities are coordinated for the Brigade Commander by the Brigade Executive.

The special staff contains many of the special staff sections that would be found in the special staff of an infantry division. This is to permit direct liaison with sections in the division staff and also because of the semi-independent nature of the brigade. In addi-

THE ENGINEER AMPHIBIAN COMMAND

tion to the normal special staff sections, however, it should be noted that there is a boat maintenance section. The importance of boat maintenance is such that the Brigade Commander must have on his immediate staff an officer who is fully acquainted with all the problems involved in marine maintenance.

It remains to be stressed that the relationship between the Engineer Amphibian Brigade staff and the staff of the ground force division to which it is attached must be unusually intimate. While the brigade itself is subordinate to the division, the Brigade Commander and members of his staff possess knowledge and information which the Divisional Commander should have in making his decisions. The division is, in a very real sense, dependent upon the brigade as it is dependent upon a railroad during movement by rail, and the tactical commander must rely upon the advice and recommendations of the brigade staff if he hopes successfully to complete an overwater crossing.

Staff work in engineer amphibian operations is of particular importance for the following reasons:

S-1: Fifty to sixty percent of the personnel of some engineer amphibian units are specialists who must be carefully selected and classified—and for whom replacements must be always available. The personnel functions of the unit staff are, therefore, of particular importance.

S-2: Successful landings are often entirely dependent on skilful reconnaissance of enemy-held beaches. Charts may be wholly inadequate or inaccurate. The ingenuity and thoroughness of S-2 will be taxed to the utmost.

S-3: Successful crossings as well as landings are dependent upon successful navigation and control. A beach which is scores of miles away on an enemy-held coast is an extremely difficult landfall to make at any hour even under ideal conditions. Most crossings will be made under cover of darkness, with radios silenced. Under such circumstances, the navigator's problem can easily be imagined—yet at this moment the success of the entire expedition rests on his shoulders. If he brings his fleet in at the wrong beach—or at the wrong hour—the attacking force may be wiped out in a single action. Amphibian battles can be lost easily for want of navigational accuracy.

Successful crossings as well as landings are also dependent upon the successful maintenance of communications. Waves must reach their destination intact and in proper order or the entire landing operation may fail for lack of coordination.

S-4: Landing craft cannot live on an armful of hay and it takes more than curry-combs to keep them in running condition. Successful operations, from beginning to end, are dependent upon the foresight and ability of officers charged with supply functions.

If there is one lesson that modern war teaches, it

is that the battlefield is at the forward end of the supply line. Victory is completely dependent upon a continuous flow of all types of supplies and equipment.

The tremendous tonnages required in landing operations, coupled with the problems of handling these supplies on the far shore, present one of the greatest challenges that a commander and staff will ever be called upon to face in the field of logistics. These problems are not secondary to combat, but of equal importance, and continued neglect to face them will result in disaster.

EQUIPMENT

Background.—Assault troops can be landed on enemy held beaches from any kind of vessel or vehicle that floats. The Germans have put outboard motors on rubber boats and crossed rivers too broad to bridge. The Japanese have often provided water-borne transportation for their troops by commandeering local craft—small fishing vessels, barges, even row boats. Ferry boats helped tow their landing forces across to Corregidor. Sea-going transports—or even destroyers or light cruisers—may be run aground on the enemy coast, the assault troops reaching the beach simply by jumping overboard or climbing down nets into the surf.

Early in this war, however, the need for an effective way to assist assault troops in establishing beachheads on hostile shores made itself felt. It is probable that the frustrated plans of the Germans to cross the English Channel in 1940 gave the first impetus to the creation of specialized craft for transporting landing troops. Also, our desire to get back on the continent made the designing and building of boats that could do the job a problem to be tackled at once.

What was needed for crossing water to land on enemy beaches was a boat which would be:

- a. Sturdy and seaworthy—to stand the crossing itself.
- b. High powered—not simply for speed but to facilitate retracting. It takes surplus power to pull a boat off the beach.
- c. Shallow draft—for landing on beaches from which the attacking forces could deploy rapidly, and to facilitate retracting.
- d. Of large carrying capacity—big enough to carry the mobile equipment and artillery without which an attack in force could not be delivered.
- e. *Uniquely easy to unload.*

The last requirement was the most important of all, for without a way to get the vitally needed rolling stock on shore quickly, the whole idea of delivering a mechanized attack on an enemy beach fell to pieces. The Marines' "A Rig" was all right if one had perfect weather and perfect beach conditions and plenty of time to set it up on a hostile beach. But with aerial reconnaissance, highly mobile reserves, and radio communication all at the enemy's com-

MILITARY REVIEW

mand, the likelihood of having such leisure to unload grew less and less.

The shallow-draft, ramp-loading boat cut through this problem with a single stroke of design. With its development, the landing craft as we know it today became a fact—a soon-to-be-established standard piece of military equipment the world over.

Curiously enough, the Japanese, who were the first to win major victories by the employment of amphibian troops, were less ingenious in the design of their equipment. Although accounts of the Kra Isthmus campaign refer to "specially built knocked-down landing craft which were assembled at the point of embarkation," the Japanese equivalent of engineer amphibian troops are remarkable for the thoroughness of their training rather than for the mechanical aids with which they are equipped. It remained for English and American engineers to give us the basic design for the landing craft with which we won a beachhead at Guadalcanal and established our forces in Africa.

By the time America had been at war for six months, there were scores of experimental types of landing craft afloat, and several had even gone into mass production. Standardization was indicated. Four types had proven acceptable. Each filled a need.

The first need was for a landing craft to carry personnel—a comparatively fast boat, easy to maneuver. A ramp bow was not then considered an absolute necessity, although easy egress was of vital importance when surf conditions were expected. The most practical length seemed to be between thirty and forty feet.

The second need was for a vehicle carrier of about this same length, but designed to load any of the light vehicles used by the landing forces. For this craft, a ramp bow became a necessity.

The third need was for a lighter—a craft big enough to carry a medium tank, heavy vehicles, or artillery: length around fifty feet, twin-screwed.

The fourth need was for still bigger craft—lighters over one hundred feet long, of slightly greater draft and less maneuverability, but capable of going longer distances and able to carry several tanks or trucks, or large quantities of equipment and supplies.

It was decided that the vehicle carrier could also serve as a personnel boat. Slight changes in design afforded coxswain and troops more adequate protection, and the ramp was widened to allow loading of the $\frac{3}{4}$ -ton weapons carrier. This type is called the LCVP.

The fifty-foot lighter had proved its worth and was retained. As standardized, it is known as the LCM(3).

These two vessels, which are now the basic engineer amphibian landing craft, are pictured and described in Figures 2 to 15 (pages 18 and 19).

The addition of fleets of the still larger tank lighters, multi-motored vessels over 100 feet in length, will be normal in most engineer amphibian operations.

Two other members of the engineer amphibian's boat fleet should be mentioned. They are the command and navigation boat and the patrol boat. Their names indicate their functions.

The development of specialized landing craft was paralleled by similar efforts to perfect true amphibian vehicles which would roll into the water, cross under their own power, and roll out on the far shore to get into action. The essential limitation of all true amphibian vehicles is still to be overcome. They are built to operate in two elements; the more effective they are in one, the less effective they are in the other.

Reference to the essential limitations of amphibian vehicles as "still to be overcome" is meant literally. The advantages of an all-purpose amphibian vehicle are obvious. Even more effective designs are being sought and there is no doubt that the problem will eventually be solved. But at the present time ramp-type landing craft, rather than amphibian vehicles, remain the foundation on which engineer amphibian tactics are based.

It is not sufficient merely to discuss landing craft. Equipment for the adequate maintenance of these craft is an important item. Mobile shop trucks and other gear are essential. Antiaircraft machine guns and other weapons are needed in numbers. Defense ashore as well as afloat is vital. Bulldozers and equipment for work on shore are needed to expedite unloading and clearing of beaches. Special medical, signal, and navigating equipment must be available. It all adds up to a substantial figure, but to only a fraction of the tonnage and manpower needed to move an infantry division in a ship-to-shore operation. Furthermore, there is no shuttling of assault elements—the principle of mass is not a hollow phrase in a shore-to-shore operation.

TRAINING

The training required to develop the amphibian team is staggering. The percentage of specialists may possibly exceed that of armored force units. Boat crews consist of three or four men. The coxswain must be a complete master of his craft. The engineman must keep his craft in mechanical operation despite beachings over boulders and through sand bars. Even without the effect of collisions with beaches, salt water and sand are not kind to internal combustion engines. Even the crew member with the unimpressive title of "deck hand" must be able to spell his comrades, operate antiaircraft guns, and be a proficient signal man. Specialized training, therefore, is the order of the day. An Amphibian Troop Officers School has graduated over 700 students of all ranks. Over 500 officers have had navigation training,

THE ENGINEER AMPHIBIAN COMMAND

about 150 of them graduating from a navigation course at Harvard University. Over 1,000 enlisted men have completed radio schools; 3,000 men have received technical and mechanical training at 28 schools throughout the United States. The boat school at Higgins Industries has graduated more than 1,000 officers and men for the command.

Thorough basic training has also been accented. Some of the first units suffered because time prevented such training. One brigade, however, qualified 89% of its entire T/O personnel in rifle marksmanship before it was ten weeks old, despite winter and early spring weather on Cape Cod. Voyages of over 2,000 miles along the coast have been made on schedule with flotillas exceeding 50 boats.

In addition to such training, combined training with infantry divisions has been invaluable in seasoning all concerned. Much has been learned from such training. In its first six months of existence the Engineer Amphibian Command put in over 2,000,000 man-hours afloat *without the loss of a man*. Approximately 25% of this training was under cover of darkness.

EMPLOYMENT

Waterways must not be considered only as obstacles because they frequently offer the best and sometimes the only routes of advance. The futility of fighting with imperceptible gains through fastnesses or jungles when an enemy flank can be turned at sea should be apparent. This is particularly true when our forces are dominant in the air. This war will not be won by outwaiting the enemy, but by outfighting him. The story of the Kra Isthmus deserves more consideration. Unfortunately, its import is sometimes muddled by lack of success on the part of the Japs at Guadalcanal and Buna and on the part of the Germans in Tunisia. A fair appraisal of relative airpower and its effect in these operations is worthy of consideration. The question can now be asked—If the United Nations had possessed the *capability* of enveloping the German Mediterranean flank by water last winter, what effect would it have had on the Battle of Tunisia? Could Rommel have massed as much of his force in the south? If he had, could we have secured a beachhead behind his flank? Or if he had shifted his reserves to the north to meet this threat, could we have broken through his center more rapidly and conserved time—precious time?

Or in another theater—Was it better to move on Akyab by land or water? Why does a nation that calmly speaks of 50,000 tanks and 100,000 planes, view with awe the problem of a few thousand landing craft? It is true that, in many cases, distances over the sea prevent shore-to-shore operations. Even in these cases, however, the possibility of such operations *after* the initial beachhead is secured deserves careful thought. As the attack on Europe is pressed home—and it must be—the problem of large transports standing by to unload with submarines on the

prowl, and the concentrated air power of a desperate enemy, operating on interior and ever-shortening lines of communication, an ever present threat, is a serious one. Whether they move combat troops or supplies and equipment, landing craft will usually be an important adjunct and sometimes a *sine qua non*.

ENGINEER AMPHIBIAN TROOPS IN ACTION

Pattern of Action.—Many amphibian attacks have already been delivered by the United States and its allies in this war. Assault troops have been transported across the English Channel, to the coasts of Norway and France, to the coasts of North and West Africa, and to the shores of the Solomon Islands. Whether delivered from ship-to-shore or from shore-to-shore, the operations of the fleets of landing craft themselves were essentially the same. Each cycle involved five distinct steps:

1. *The gathering and loading* of the landing craft, out of range of enemy guns.
2. *The voyage* of the laden landing craft to just beyond the range of the enemy's guns, where they took up their battle formations.
3. *The attack itself*, in successive waves of landing craft, deployed for protection against enemy fire.
4. *The organization of the beach*, to facilitate its crossing by the combat units.
5. *The rapid retraction and regrouping* of the landing craft for the next crossing with reinforcements and supplies.

In the course of these actions, and in training, this basic pattern for all amphibian attacks has been formalized. Similar tactics are followed by the Army's Engineer Amphibian Command, by the brigades that have been trained by it, by the Navy's Atlantic and Pacific Amphibious Forces, and by the amphibian transportation forces of our allies. A common nomenclature is used by all.

It must be borne in mind, however, that the following description of this "standard procedure" is both simplified and schematic. The variations which will be met in the field are almost infinite.

For instance, in delivering a surprise attack on the Solomon Islands, the Navy on one occasion simplified its attack to a single wave of all available landing craft. The whole force roared in through the breakers, abreast. In an advance consisting of a series of jumps along a continental shore line, the progress of a fleet of landing craft may bear no resemblance whatever to the orderly design that is here illustrated. The engineer amphibian officer must know the standard pattern well before he is qualified to improvise, or to recommend improvisation to the tactical commander.

Joint Operation.—Amphibian attack is a joint operation; land, sea, and air forces are involved. Throughout this chapter it will be assumed that engineer amphibian landing craft are proceeding from friendly near to hostile far shore:

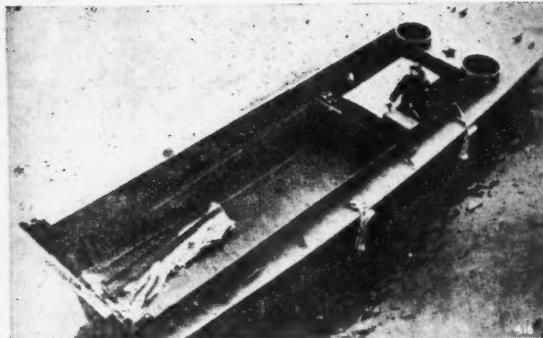


FIGURE 2.
The LCVP (Landing Craft, Vehicle, Personnel).



FIGURE 3.
The LCVP, front view.

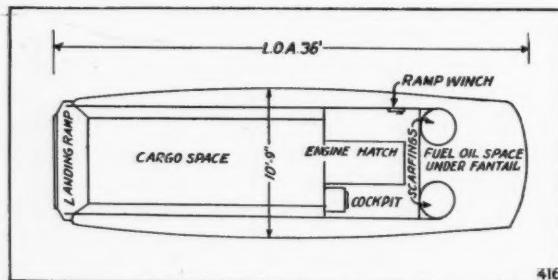


FIGURE 4.
General layout and principal dimensions of LCVP.

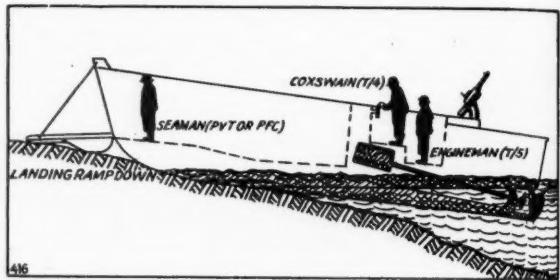


FIGURE 5.
LCVP. Profile sketch showing lines of hull. The boat is beached and the ramp lowered.

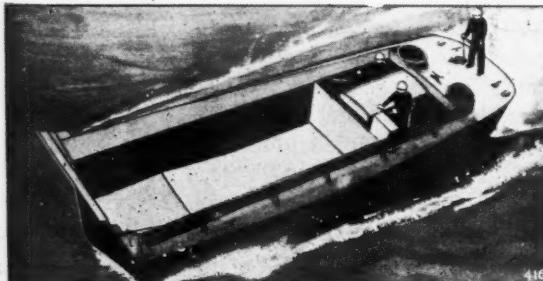


FIGURE 6.
The crew of the LCVP. Coxswain, engineman, and seaman.

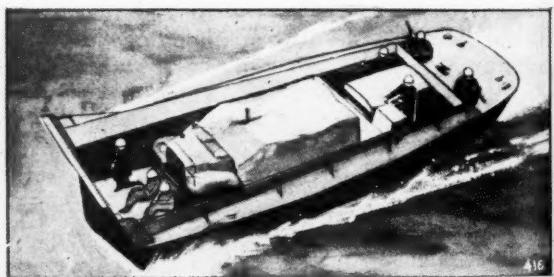


FIGURE 7.
How an LCVP transports 3/4-ton weapons carrier. The two scarfs just aft the engine are manned by the LCVP's own crew when other personnel is not available.



FIGURE 8.
The LCVP carrying its maximum load of 36 troops including machine gunners.

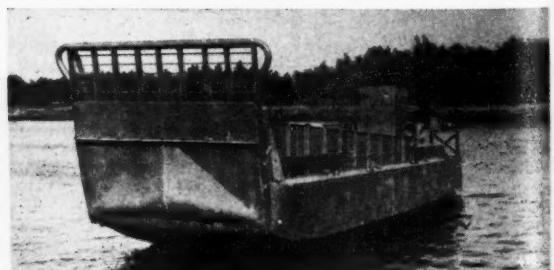


FIGURE 9.
The LCM(3) (Landing Craft, Mechanized Equipment, Model 3).

THE ENGINEER AMPHIBIAN COMMAND

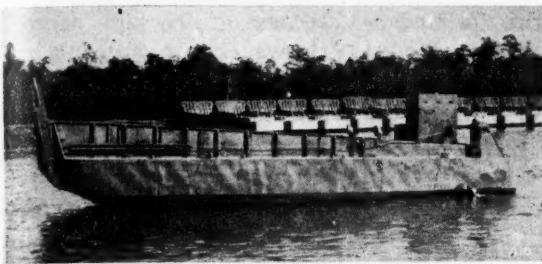


FIGURE 10.

The LSM(3), side view.

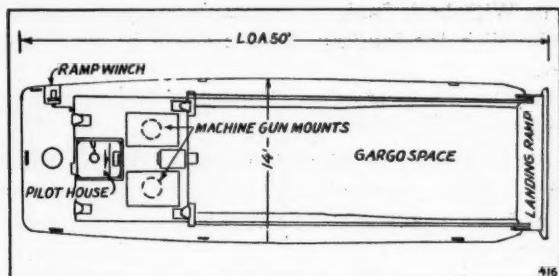


FIGURE 11.

General plan and principal dimensions of the LCM(3).

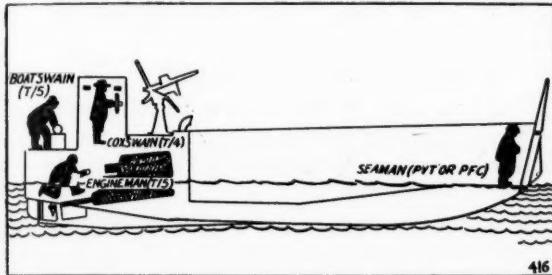


FIGURE 12.

LCM(3) profile sketch showing lines of hull and starboard machine-gun mount.

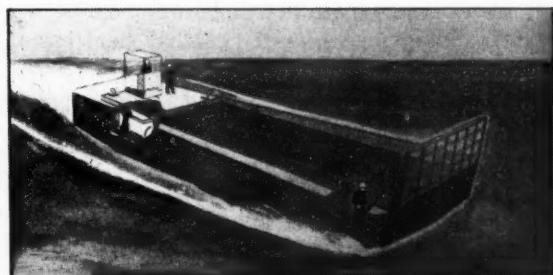


FIGURE 13.

Perspective sketch of LCM(3) showing crew.

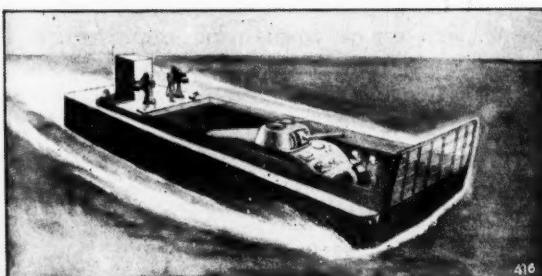


FIGURE 14.

How a 30-ton medium tank is carried on an LCM(3).

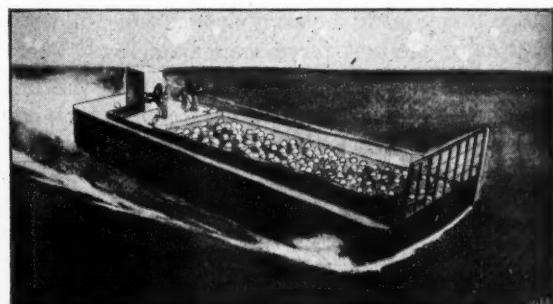


FIGURE 15.

Sixty thousand pounds of cargo can be transported in an LCM(3), or troops may be carried.



FIGURE 16.

An LCT(5) about to land. Note the beach markers.

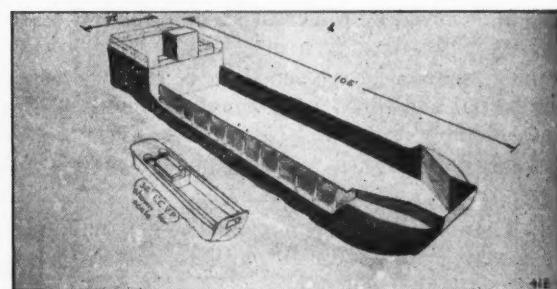


FIGURE 17.

Perspective showing cargo area and principal dimensions (105 by 32 feet) of an LCT(5) in comparison with a 36-foot LCVP.

- a. With both flanks protected by naval support.
- b. With the landing itself covered by naval gun fire.
- c. With the protection afforded by local air superiority.

Under ideal conditions the attack itself will have been prepared for by the landing of parachute troops—and dive bombers will be available to reduce enemy strong points.

The tactics of the combat troops are not discussed here, although certain basic assumptions have been made in the interest of simplification. These assumptions are:

- a. That normally constituted combat units are being transported—battalion landing groups, regimental landing forces, or the combat elements of a division.
- b. That the attack formations employed are normal—i.e., led by light covering forces and supported by more heavily armed units.
- c. That the attacking force, while expected by the enemy, has still been able to maintain some element of surprise. The enemy presumably does not know the time nor place of landing and, particularly, is not aware of the location of the *main effort*.
- d. That the first waves landed are successful in driving the enemy out of small-arms range.

Area of Responsibility.—Engineer amphibian troops are responsible for carrying out their prescribed functions in a clearly defined zone, under the direction of the task-force commander.

This zone is bounded on the near shore by the limits of the brigade's *Dispersal Areas*, which in turn must be accessible to the Embarkation Areas. On the far shore, the engineer amphibian units' responsibility ends when they have facilitated the movement of the assault troops with their equipment and supplies to "nearest available cover" inland from the beach.

The Crossing from Near Shore to Far Shore (see Figure 18).—There are three problems involved:

1. There is the problem of how to maneuver the laden landing craft from the Embarkation Points into a formation which can be controlled during the crossing.

This is solved by the creation of *Assembly Areas*. An Assembly Area is a definitely located area off the near shore where assembling of landing craft is carried out and times and formations checked. Several Assembly Areas may be selected. Areas will not normally be assigned to units smaller than a boat company.

2. There is the problem of how to get the landing craft, which are now in formation, across to within range of the enemy shore.

To accomplish this, the landing craft are led by *Command and Navigation Boats* responsible for navigation, and are shepherded by *Patrol Boats*. The weather at the time of attack will have considerable

bearing on the gap between boats. In brilliant moonlight, for instance, because of the high degree of visibility afforded by the wakes of the speeding boats, they would be separated as widely as possible.

3. There is the problem of how to adjust the organization of the fleet for the final attack.

This is mastered in what is called a *Rendezvous Area*. A Rendezvous Area is a definitely located area off the enemy coast. The distance off the far shore is governed by the effective fire of the enemy's guns there; small landing craft well dispersed make a difficult target from the shore.

Towards the enemy shore, the Rendezvous Area is bounded by the *Line of Departure*. This is the starting line, across which the attack formations are dispatched.

From Assembly Areas to their objectives, landing craft follow courses which are called *tracks*. All craft may proceed on a single track or, for tactical reasons, different formations may follow different tracks.

All these elements are shown schematically in Figure 18.

The Attack Itself.—Landing craft attack in waves. The number of waves and the composition of each wave—as well as the place and time of the attack—are the problems of the tactical commander. The engineer amphibian unit executes his orders. It is the problem of the engineer amphibian commander to furnish the bottoms which will carry the load, without regard to his own administrative organization. In other words, waves of landing craft of different types from different platoons, and possibly even from different companies, may be required to move together across the Line of Departure.

Other Missions.—Units of the Engineer Amphibian Brigade can be used for still other purposes. From its allotment of antiaircraft machine guns and gunners, detachments can be drawn for the defense of harbors, beachheads, airports, etc.

Furthermore, boat battalions may be separated to operate ports and other utilities. In a similar manner, shore battalions can be used to build air fields and to construct general utilities.

Not all amphibian crossings will be to hostile beaches. Our own advanced bases can be re-supplied by fleets of landing craft. All during 1942 the Japanese supplied their forces on Guadalcanal in part by motor barges. So regularly each night did they run in from Bougainville—260 miles away—that the Marines called their service the Bougainville Express. It got through despite the fact that we had both sea and air superiority.

Thus, the engineer amphibian unit can also be thought of as functioning from friendly near shore to friendly far shore. This is an important consideration wherever waterways are available for trans-

THE ENGINEER AMPHIBIAN COMMAND

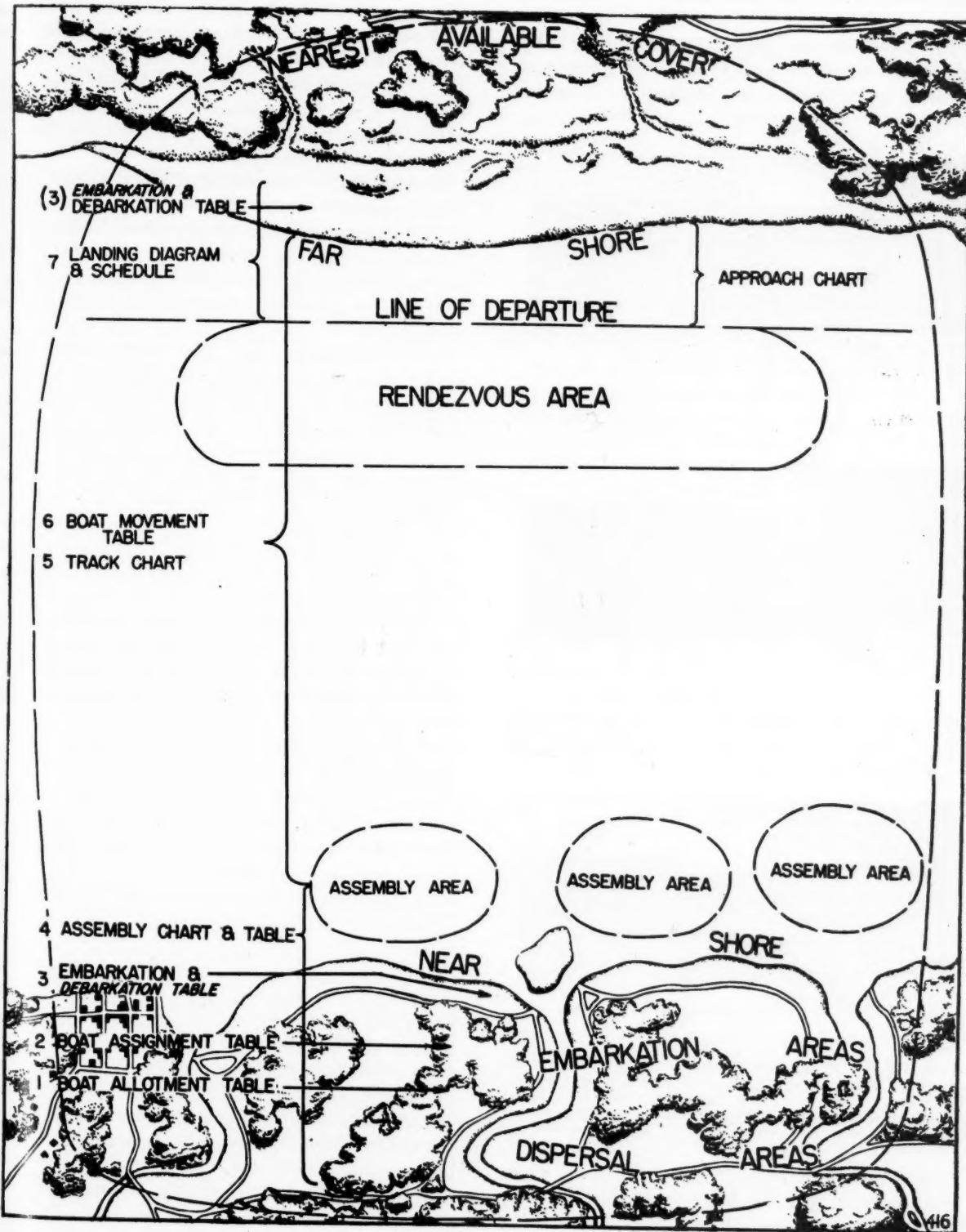


FIGURE 18.

MILITARY REVIEW

port. Rivers, shore lines, or open bodies of water leading from the rear towards the front are no longer a hindrance but an aid to military operations.

Example of Employment.—The following schematic diagrams show how an Engineer Amphibian Brigade may be continuously employed during succeeding phases of an advance across water.

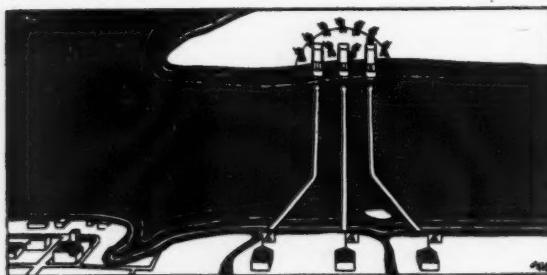


FIGURE 19. (Schematic)

First Phase. Three Engineer Amphibian Regiments transport combat units to the enemy-held shore.

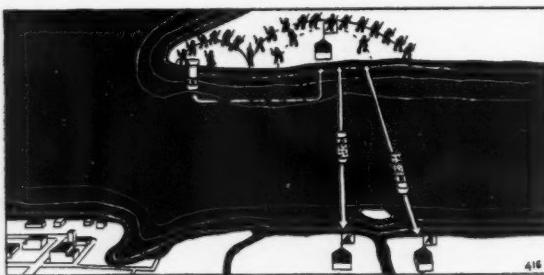


FIGURE 20. (Schematic)

Second Phase. One Engineer Amphibian Regiment now supports one regimental landing force in a flank attack to enlarge the beachhead. Two Engineer Amphibian Regiments re-supply from near shore to far shore.

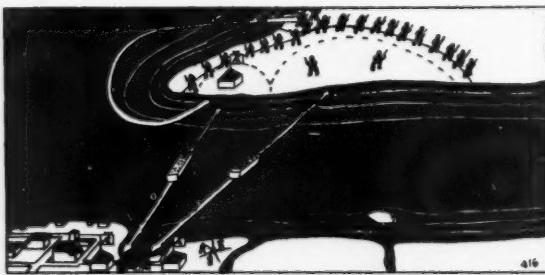


FIGURE 21. (Schematic)

Third Phase. One Engineer Regiment then transports one regimental landing force by water to attack enemy in rear. The other two Engineer Amphibian Regiments have begun bringing up supplies from the nearest usable port, and are returning prisoners and wounded. They have organized and are defending the harbor.

Orders and Annexes.—Details have been intentionally omitted from the preceding pages. It is important to have the pattern of an amphibian fleet's crossing firmly in mind before considering how its synchronization is achieved. The solution is simple in theory, highly complex in practice.

Orders for the movement of the engineer amphibian fleet in the shore-to-shore operation include cer-

tain charts, tables, diagrams, and schedules. They are issued frequently as annexes to the written or verbal orders of the appropriate commander and contain necessary detailed instructions for the co-ordination and control of the operation. These instructions are (see Figure 18, column on left):

1. *The Boat Allotment Table*—which allots the boats by types and numbers to the various combat units and amphibian units. (Accompanies division and regimental orders.)

2. *The Boat Assignment Table*—which shows which men and what equipment go in which boats. (Accompanies battalion and company orders.)

3. *The Embarkation and Debarkation Table*—the schedule of the loading and unloading, all units accounted for. (Normally accompanies regimental orders.)

4. *An Assembly Chart and Table*—which gives directions for movement from Dispersal Areas to Embarkation Areas and thence to Assembly Areas. (Accompanies regimental and battalion orders.)

5. *The Track Chart*—which maps the courses from the Assembly Areas to the far shore—and back. (Used by all navigators and boat units.)

6. *The Boat Movement Table*—which is the time table of the whole crossing from the Assembly Areas to the far shore. (Used by all navigators and boat units.)

7. *Landing Diagram and Schedule*—which shows the fleet's formation into waves, the time between waves, the spacing between boats in waves, etc. (Accompanies battalion landing group and boat company orders.)

If the final approach to the beach presents an exceptionally difficult problem in navigation, an *Approach Chart* may be included in the annexes noted above. This chart shows hazards to navigation and underwater obstacles, and the courses which must be followed to avoid them.

The *Assembly Chart and Table* may be combined with the *Track Chart* and the *Boat Movement Table* when desirable.

Organization of Beach.—In the sense that they are responsible for smoothing the path, engineer amphibian units "transport" equipment and supplies of the landing parties inland from the beach edge to good, solid, dependable land. The landing of engineer amphibian shore troops is synchronized with the attack. The forward echelon of the headquarters platoon of the engineer shore company lands with the attached boat control section—normally in the third wave. By this time the assault troops who landed in the first and second waves have cleared the enemy beach defenses, so that this forward echelon of shore engineers may proceed with its task of initiating command, control, and communication in the landing area.

The forward echelon includes the shore company

THE ENGINEER AMPHIBIAN COMMAND

commander, his second in command, and the reconnaissance officer, as well as beach-marking teams and communications and message center personnel. Its personnel and equipment are divided into units which can, if necessary, function independently, and each of these self-contained units is transported in a separate boat. This practice of not putting "all the eggs in one basket" is followed in the employment of all units of the shore company. Thus, even if a boat load of men is lost through enemy action, or through faulty navigation or boat handling, similarly trained specialists from the same unit are available to carry on their functions.

The specific duties of the forward echelon group include:

- a. Marking the limits of the beach with appropriate markers.
- b. Establishing command posts for shore company and boat control section.
- c. Setting up a message center and establishing and maintaining communications.
- d. Reconnoitering for—selecting and marking—sites for beach roads, vehicle unloading points, dumps for various types of supplies, and defensive weapons.
- e. Recording units and supplies landed.
- f. Keeping a situation map.

Thus, when the pioneer platoon arrives in the fourth and fifth waves, the terrain has been surveyed and it may go directly to work.

A beach exit road is a road leading from the surf line to solid terrain. It may be required simply to cross the beach itself—or it may be needed to cross dunes or marshland inland from the beach. If possible, it will connect with any existing road net. The essential thing is that it furnish an avenue of exit for vehicles—either to a road net, to cover or concealment, or to open country across which the vehicles may disperse.

Rolls of steel netting or sections of prefabricated metal are standard equipment for shore engineers. Beach surfaces may have to be improved with whatever material there is at hand—the leaves of palm trees, brush, burlap, driftwood, etc. Quick and accurate "spot" judgment of terrain features is basic to sound planning of all beach transportation.

All this has taken place during the very early stages of the operation. The immediate objective is to organize the beach area to receive the heavier vehicles, equipment, and supplies which will follow the initial assault waves.

Normally, the utility platoon of the shore company will be landed in the later waves. This platoon is especially trained and equipped to handle supplies and equipment brought to the far shore. Supplies must be unloaded from landing craft and placed in appropriate dumps by personnel of the utility pla-

toon, assisted by other shore engineer personnel not otherwise engaged.

The remainder of the personnel and equipment of the shore company will be landed as soon as their services can be utilized.

As supplies are landed, dumps are organized at points previously selected by the reconnaissance officer for ammunition, gasoline and oil, water and rations.

Clearing the Beach.—From the begining to the end of the attack the primary objective of all concerned—of both engineer amphibian and assault troops—is to keep the beach clear. Congestion must be avoided; lateral movement must be limited.

By the time the waves carrying heavy wheeled equipment arrive, roads should be prepared by the engineer amphibian shore troops, marked and ready for use. Sighting the beach markers from several hundred yards off shore, the coxswains of the heavier vehicle-carrying boats proceed direct to the beach exit roads. There, detachments of shore troops stand by to facilitate unloading.

The most important single tool of the engineer amphibian shore company is the angledozer. It removes obstacles, assists in making roadways, and rescues mired or stalled vehicles. Angledozers are even used to push grounded boats off the beach.

Final Steps.—As the attack progresses, the responsibilities of engineer amphibian troops multiply. With the final organization of the beach these include:

- a. The establishment of a clearing station (by units of the medical battalion) and the reception of casualties incurred on the beach.
- b. Salvage work on the beach (by detachments from the boat control section).
- c. Establishment of shore-to-boat and shore-to-shore radio nets, as well as wire nets linking engineer amphibian shore units and tieing in with the infantry's nets.
- d. The guarding of prisoners of war taken by the assault troops, and their evacuation to the near shore.
- e. Reception of casualties sent back by the advancing assault troops and their evacuation, along with the engineer amphibian casualties, to the near shore.

No attempt is made to give a full inventory of the duties and responsibilities of engineer amphibian officers and troops on the far shore during and immediately following a landing.

While engineer amphibian troops do not proceed with the combat units beyond the first available cover, their responsibility for the beach normally continues as long as it is used as a port of entry to the beachhead. *To the beach*, they will continue to

MILITARY REVIEW

bring supplies. *From the beach*, they will continue to evacuate wounded and prisoners of war.

Throughout the attack, engineer amphibian shore troops share responsibility for security on the beach—from land, air, and sea attacks.

RELATION TO DIVISION ENGINEER UNITS

The mission, functions, and general employment of amphibian shore engineer units are basically separate and distinct from those of division engineers. However, shore engineer units and division engineer units are jointly employed in one phase of the combined amphibian operation, namely, on the near shore and prior to embarkation. At this time division engineer units may be called upon to assist shore engineer units in the development of facilities for embarkation as necessary.

On the far shore, units of the shore engineers execute all engineering work necessary to facilitate the landing of personnel and supplies, and their movement over the beach inland. However, since working details of shore engineer units do not land in the initial assault waves, certain duties must be performed by elements of division engineers which land with assault troops in the initial waves. These duties are:

a. Demolish enemy underwater and beach obstacles.

b. Remove or make a passage through enemy mine fields.

c. Reduce permanent fortifications by use of demolitions.

d. Assist the shore engineers to facilitate the movement of personnel, equipment, and supplies from landing craft across the beach area.

e. Conduct engineer reconnaissance.

The responsibility of shore engineer units extends inland to include the establishment, maintenance, and control of all initial supply dumps inland from the beach. This responsibility is given to shore engineer units in order that division engineer units may be released from required engineer tasks in the beach area, and to permit division engineer units to advance inland with combat troops to perform their normal mission.

The line of demarcation, then, between the responsibility of shore engineer units and division engineer units during the development and establishment of the beachhead is drawn at (and includes) the initial dumps. From this line inland, responsibility is with the division engineer units.

Counter-orders

FREQUENT changes in orders seriously affect morale. Men lose confidence in their superiors. "Order—counter-order—disorder," is more than a pungent expression—it borders perilously close to truth. Pointless vacillation, whether it be the lieutenant with his platoon or the general officer with his army, cannot be too vigorously condemned. Only the exigencies of a changing or obscure situation can justify the serious effects of the counter-order . . . Many of them, probably most of them, result from the obscurity of war. In mobile warfare we know the situation will invariably be vague. As information filters in to the higher commanders, changes in dispositions will be required. The information on which these changes are based will seldom reach the lower units at the time. They will read about it in a book after the war.

Counter-orders, therefore, must be regarded as normal, accepted cheerfully, and passed downward in that spirit.

—*Infantry in Battle*.

Air Support of Ground Units in South Pacific Operations

The following account is an excellent example of the results that can be obtained by the close coordination of air and ground units operating against a hostile force occupying a defensive position on reverse slopes in heavy jungle terrain.

This report was submitted by an air officer following a recent action in the South Pacific and shows what can be accomplished by proper liaison and planning prior to an engagement.

AIR LIAISON was established with the division prior to the inauguration of their reconnaissance in force. A discussion of the limitations and scope of air support was held with the division staff. Methods of communication and liaison were established and the types of airplanes available and effects of the several classes of bombs were discussed and missions planned.

The heavy jungle is cut by bare ridges and deep ravines. The precipitous walls of the ravines are several hundred feet high. The bottoms of the ravines are covered with heavy jungle, offering excellent positions for enemy machine-gun nests and strongpoints. Advances through this terrain require successive cleaning up of these strongpoints. Artillery fire can reach the far slopes of ravines, and in some cases the bottoms. However, it is not able to reach the reverse slopes where the Jap digs in securely. The problem for air was to bomb these reverse slopes immediately preceding a ground push into the ravine.

The problem was to blast the Jap out of these positions. It was felt that the terrific blast would be very useful in killing Japs in their dug-in positions in the confined spaces of the ravines. It was agreed that air would be used only on those areas not accessible to artillery, after it was definitely established that a strong point existed.

On the morning of the attack, the artillery shelled the area to be advanced into from 0500 to 0620. At 0620 the artillery laid a line of smoke shells in front of our lines (about 100 yards) which marked the line beyond which our airplanes were to bomb. Twelve P-39's and twelve SBD's observed the shelling from above. Immediately after the line of smoke shells was visible at 0620, the airplanes dive-bombed the reverse slope immediately in front of our lines. The

infantry immediately advanced into and took the area with small losses. Later the same day, another strongpoint was encountered. Six P-39's cleaned it out so that the infantry walked in with no opposition. Four Jap officers and fifty men were found dead in the area. This type of operation continued daily, and about two missions a day were completed.

Due to the proximity of the advanced O.P. from the fighter field, the liaison and communications problems are not difficult. When the strongpoint is encountered, the liaison officer proceeds to fighter operations and carefully briefs pilots. The artillery is asked to lay smoke on the target as soon as all friendly troops have pulled back (about 100 yards). In the meantime the liaison officer leads the flight over and drops his bombs on the smoke signal. The entire process takes about one hour.

This close contact between division OP, division artillery, and air liaison reduces the communication problem to a minimum and allows us to operate on direct lines. Ground troops stay as far forward as possible so as to take immediate advantage of the shock created by the bombing.

A spirit of mutual confidence has been built up between the air and ground units involved. After the first day, ground troops were most confident in and enthusiastic for air support. These operations are continuing.

A study is being made as to the effect of different bombs in these confined areas, and the results will be forwarded as soon as possible.

During the above operations, it became necessary to drop ammunition and supplies to our flanking element due to the lack of trails and the speed of the advance. Thirty-five thousand pounds were dropped from B-17's on three days. Of the total dropped, approximately 95% was recovered and usable. A minimum number of supply parachutes and packs were available. These were used for dropping mortar shell cloverleafs and water. Four five-gallon water cans were securely wired together and attached to the parachute. Only three water cans were broken in dropping. Ammunition boxes, 40-pound boxes of "C" and 75-pound boxes of "D" rations were heavily wrapped in burlap and thrown out at a low altitude. Less than 5% of these supplies was damaged beyond use.

The General Staff Course Today

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IN THE last issue of the MILITARY REVIEW, Colonel Shallenberger, Assistant Commandant of the Command and General Staff School, wrote of the changes at Fort Leavenworth. Not the least of these changes has been the gradual evolution of the General Staff Course into its present form.

On second thought, it has not been so gradual; the course has kept pace with and in many cases has anticipated the rapid changes in operational technique developed as our fighting forces are tested in battle.

The mission of the General Staff Course remains basically unchanged: "To train selected officers of all forces in basic command and staff doctrine and as staff officers, general and special, to meet the requirements of divisions, corps, and similar units, both ground and air."

In planning a course to accomplish this mission several factors had to be considered. First, because of the number of graduates needed it is necessary to train many officers of limited or specialized background. The course therefore must provide a broad foundation of general military knowledge, to include organization and operational and staff doctrine.

Second, because of the specialized staff work peculiar to air, armored, and infantry units, which it is the mission of the course to teach, it is necessary to provide specialized instruction for three major student groups. On the other hand, since it is impossible to predict future staff assignments to students, the course must teach all students of each group the functions and technique of all staff sections.

Third, because War Department plans call for the graduation of the maximum number of students per year up to five thousand, a schedule has been established calling for the graduation of a class every ten weeks. The limitation on the time available has dictated the content of the present course, the deadwood of which has been carefully pruned, as well as a few live branches to keep the tree from being lopsided.

Heretofore the special courses have run for nine weeks, with a break of one week between classes. However, on Sep-

tember 6 the Fifteenth General Staff Class and the Seventh Service Staff Class will begin courses which will run until Thursday of the tenth week, with succeeding courses commencing the following Monday.

The Fifteenth General Staff Course has been designed as an integrated whole. In staff phraseology it is a coordinated attack with a detailed plan, to include initial and intermediate objectives as well as the final objective.

The following chart is an analysis of the schedule for the Fifteenth General Staff Course. Note the amount of instruction specialized according to the needs of the three basic groups.

Instruction is presented in many different ways. Basic principles are usually explained in the form of conferences. Certain subjects are illustrated by

FIFTEENTH GENERAL STAFF COURSE PROGRAM BY PHASES

	All	AAF	Armd	Inf	Total
PRIMARY: To establish a fundamental concept of:					
a. The military establishments.....	5				
b. Organization and employment of large combat units—ground, air and naval.....	10½	3	5	3	
c. Tactics of the arms and functions of the services.....	23½	24	14½	10	
d. Staff duties and technique.....	43	71	64½	71	
e. Review and extra instruction.....	7	8	8	8	
SUB-TOTALS.....	89	106	92	92	
INTERMEDIATE: To broaden tactical and staff concepts by joint instruction in:					
a. Operational doctrine.....	10				
b. Type operations of the principle combat units, ground and air, stressing integration of the staff sections and the application of staff technique.....	45½		14	14	
SUB-TOTALS.....	55½		14	14	
ADVANCED: To develop in detail staff and operational technique to include:					
a. Combined and joint staff organization and procedures.....	5				
b. Task force operations.....	10	10			
c. Operations of infantry, armored, air, and service units individually and within task forces.....	74	84	84		
d. Map maneuvers.....	56	56	56		
e. Preparation of field exercises; advanced training programs.....	1	8½	8½	8½	
SUB-TOTALS.....	16	148½	148½	148½	
MISCELLANEOUS:					
a. Map reading.....	4				
b. Surveys of theaters of operations; visit to Situation Room; guest speakers.....	13				
c. Administrative periods.....	6				
d. Orientation films and film bulletins.....	10				
e. Physical exercise.....	25				
SUB-TOTALS.....	58				
GRAND TOTALS.....	218½	254½	254½	254½	473

THE GENERAL STAFF COURSE TODAY

means of simple situations and requirements, and are called exercises. These two types of instruction are used principally in the primary phase. From the basic phase on, the principal medium of instruction is the map exercise, or ME, in which the staff is shown functioning as an integrated whole in the conduct of an operation.

Four map maneuvers give students opportunity actually to function as Staff officers directing and planning the movements of imaginary troops controlled by umpires in accordance with messages received.

Two tactical rides get the students away from their maps for a while to impress on them the tactical aspects of actual terrain.

A few subjects lend themselves to presentation in the form of skits. One production of the Leavenworth Players is famous throughout the Army as "Tobacco Road."

To keep its instruction up to date the school sends instructors on liaison trips, both overseas and within the United States. A special effort is made to gather operational plans used in actual battle, which are studied and the conclusions embodied in instruction. The school also maintains contact with many training and operational agencies which forward material regularly. The Command and General Staff School is a port of call for all itinerant observers, military missions, and experts recalled from combat zones, who meet with instructors and keep them posted on the practical aspects of staff and operational technique. Speakers of national repute are brought in to broaden the outlook of the students.

To keep the work interesting to the student the bulk of the problems are played on foreign maps. Norway, Belgium, France, Germany, Africa, Italy, the Balkans, China, the Philippines, the Netherlands East Indies, and the southwest Pacific are used as locale for the portrayal of U. S. forces in action against actual enemy troops. Task force principles are emphasized.

One of the high points in the course is a series of problems dealing with a combined operations landing assault on the coast of France, in which, after a skit portraying the over-all plan and the Task Force staff procedure, the infantry, armored, and airborne students work out in detail the operations of their respective divisions, the air students work on the air operations, and the coast artillery group works out the plan for the employment of AA artillery. The entire situation is based on the current German defenses, and actual air photos of the coast are used. The problem has now been running for over a year and a half, and is changed every course to conform to the current enemy situation and the latest developments in equipment and technique.

There are many other problems which illustrate

the technique of modern warfare. There is one on jungle and amphibious warfare, laid in the Southwest Pacific; one on the attack of a fortified position, laid in France; an airborne operation into the island of Rhodes; and a problem illustrating the operations of a tactical air force in China.

So much for the course itself. As to the students, they performe keep their noses close to the grindstone. The course is hard; it is concentrated; it requires honest effort. After the first few days the student's mind is whirling, but it eventually settles down to a mental dog trot which carries well over 90 percent of the class successfully across the finish line.

Many officers ask, "What can I do to prepare for the General Staff Course?" There are many answers. One will say, "Study organization"; another, "Learn to read maps"; another, "Read your Field Service Regulations and Staff Officer's Field Manuals." All excellent advice. Suit your preparation to your most serious weakness. Remember that in working under pressure, as students do at Leavenworth, you can't afford to take time out every time the word "regiment" is mentioned to think back over what a regiment is. Military terms, especially designations of organizational units, must be meaningful; their meanings must be clearly and definitely fixed in your mind.

In the same way, the ability to define a contour is no guarantee that you can read a map within the standards required at the school. An increasingly large proportion of each class—over 80 percent in the Fourteenth Class—cannot pass a relatively simple speed test at the beginning of the course. You'll handle four or five different maps a day at Leavenworth. If you take too long to puzzle over your maps you will either miss instruction or waste your study time, and you can't afford either.

As to the manuals, any knowledge of them is of course an asset. Actually, however, it is not so much a knowledge of the content which is the prerequisite, but an ability to comprehend the terminology and the references which is the really necessary thing. You will have time to study, but you won't have time to learn to read.

At the time of writing, the Fifteenth Course has not yet gone to press, but it is set up on the schedule board. The changes from the Fourteenth Course are numerous but not drastic; each change has been a refinement on already excellent instruction; the thirty-odd extra hours have helped to round out the course, give it balance and polish. It will keep some 800 students busy for nine and one-half weeks, but before they have finished, another schedule will be on the boards, more changes will have been made, and a new course will be on the way to illustrate an old truth, "There is nothing permanent except change."

Changes and Scope of the Service Staff Course

COLONEL WALTER A. PASHLEY, *Quartermaster Corps*
Director, Service Staff Course, Command and General Staff School

TO A GRADUATE of the first Service Staff class of the Command and General Staff School, Fort Leavenworth, the changes that a year has wrought in its scope and subject matter well may be amazing. And to a prospective student, the mission and extent of the current course present a stimulating vista of fruitful fields he is about to explore.

The mission of the Service Staff Course, in its endeavor to supply the urgent need for efficient staff officers, has been determined as follows:

"To train selected officers in military organization, basic staff principles and staff functions peculiar to zone of the interior and theater of operations installations and operations including service commands, ports, and the Army Service Forces in general; to fit them for duty as executives and key staff officers or assistants thereto."

To accomplish this mission, the Service Staff Course program has been divided into phases—a pathway along which the student travels through widening horizons until, at his destination, he views the "big picture."

The Preparatory Phase consists of the organization of the nation for war and the organization of the Army, with a broad general scene of the theater of operations. Included is certain technique applicable to any staff officer. This furnishes the tools which students find they must use throughout the course. A total of 99 hours is devoted to this phase, as follows: Organization for War, 7 hours; Organization of the Army, 15; Theater of Operations, 26½; Technique of Staff Procedure, 37½; and Voluntary Extra Instruction, 13.

The student moves next to the Army Service Forces (Zone of the Interior) phase, which covers all functions of the ASF from headquarters in Washington through service commands, posts, camps, stations and field installations up to the ports of embarkation and coastal defense. It is divided thus: Organization and Functions, 22 hours; Personnel Systems and Problems, 19; Supply System and Problems, 21½; Transportation Systems and Problems, 25; Internal Security and Intelligence, 32; Operational Problems, 26½; Air Forces, Supply and Transportation, 10; Coastal Defense, 9; and Voluntary Extra Instruction, 10.

Lines of Communication are next in line. This phase covers the preparation of units ordered overseas; their movements through the ports; transport loading and staff operations in ports of embarkation. Hours devoted to this phase are organized as follows: Shipping, 9½; Ports of Embarkation and Debarkation, 20½; General Supply and Equipment Plan of an Expeditionary Force, 7.

On the student's horizon now appears the Communications Zone. Here the following subjects are treated: Services of Supply, including traffic control, security, military government, staff operations in principal services of supply installations in the communications zone. This phase is broken down as follows: Service to a Field Army, 15 hours; Task Force in Overseas Operation (including SOS Phase), 13 hours; Staff Procedure in Communications Zone Headquarters, 12; Desert Training Center, 4; Control of Freight and Personnel Movements, 3; Production and Dissemination of Military Information, 4; Security, 6; Military Government, 5.

Each of the phases cited above ends in a Map Maneuver which aims at the practical application of the principles brought out by the phase. These Map Maneuvres cover Staff Procedure in a Service Command Headquarters; in a Port of Embarkation; in a Communications Zone Headquarters; and finally, in coordination with the General Staff class, in Army and Army Service Forces operations.

The work of the Service Staff class is kept abreast of developments of the global war. Problems and exercises are laid in all foreign theaters and potential theaters as follows: North Africa, Western France, Northern France, the Balkans, Italy, Sardinia, Malaya, in addition to a few areas in continental United States.

World Surveys likewise emphasize the global operations being carried on. Experts, drawing upon War Department reports or newly arrived from overseas operations, explain problems and solutions encountered there.

Open Forums afford opportunity for back-tracking to review subjects previously covered. Study assignments and physical exercise round out the course which totals some 650 hours.

Ammunition Supply in the Infantry Division

MAJOR E. R. ELLIS, *Field Artillery*
Instructor, Command and General Staff School

THE PROVISION of an adequate and continuous supply of ammunition to combat troops is absolutely indispensable to the success of any military operation. Ammunition not only constitutes the greatest mass of supplies to be moved to the troops, but is the most essential item to be supplied before and during combat. The complications of handling the numerous kinds of ammunition and the great tonnages involved create a difficult supply problem.

The responsibility for ammunition supply—like all other responsibility for the success or failure of a unit—rests upon the commander of the unit concerned. In the division the discharge of this responsibility is more immediately the concern of the G-4 who plans, supervises, and performs the administrative tasks of ammunition supply through the ordnance officer. G-4 and the ordnance officer, however, are by no means the only staff officers with a direct interest in ammunition supply. The G-3 must verify that the plan of ammunition supply will support his tactical plans, the quartermaster must know of any plans for using his trucks to haul ammunition, and the artillery commander and infantry commanders must be consulted regarding ammunition requirements for their units.

The establishment and operation of ammunition depots and ammunition supply points is a responsibility of army, and will be discharged by the army ordnance officer under general supervision of the army G-4. Normally the division will make recommendations as to the site of these installations but the principal concern of the division G-4 is with the flow of ammunition from these supply points to the troops. Still more intimately concerned with this flow is the ordnance section of the division special staff, which completes the details of procurement, allocation, and distribution of ammunition to the units of the division.

Ammunition is usually made available to the division by allocations from the corps commander of credits at designated army supply points. An ammunition credit is an allocation of a definite quantity of ammunition at a specified supply point, which is placed at the disposal of a commander for a prescribed period of time. Credits remain effective until they are exhausted or expire, or they may be revoked by the issuing authority.

In general, credits expedite supply and provide commanders with definite assurance of ammunition being reserved for them. However, each commander is responsible for making his requirements known to

higher authority and for making necessary arrangements for drawing and distributing ammunition allocated to him.

At the start of an operation, the plan of the commander includes the initial issuance of ammunition credits. Subsequent credits are made as determined by the tactical situation and the status of ammunition supply. The commander is kept informed of the status of ammunition supply within his command by means of periodic ammunition reports from combat units and supply points. When units are not promptly resupplied with ammunition or credits to meet the needs indicated by their reports, they will submit requests for more ammunition or additional credits to higher headquarters.

The schematic diagram in Figure 1 shows the flow of allocations and requests for credits.

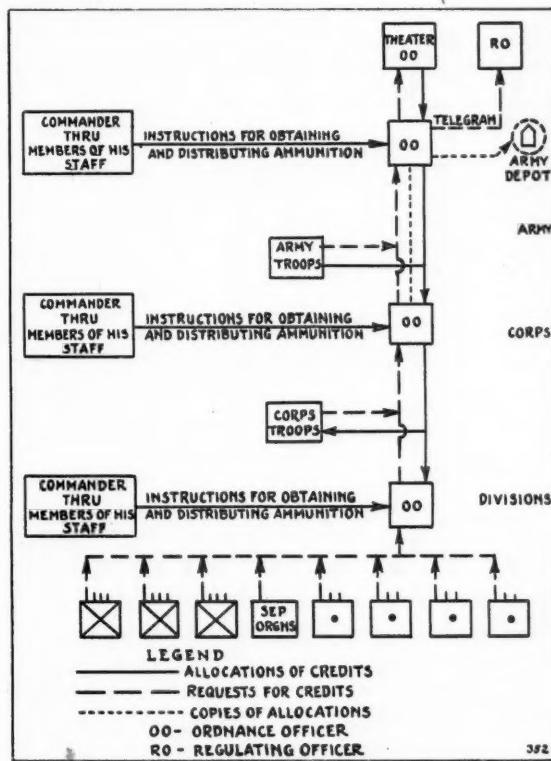


FIGURE 1.
Schematic Diagram of Flow of Allocations and Requests for Credits.

In general, allocations of ammunition originate with the theater commander and are parcelled out in turn by army and corps. When the division ordnance officer receives the allocation from corps he enters them upon his records and promptly notifies the interested staff officers and subordinate commanders.

MILITARY REVIEW

Ordinarily credits will not be allocated to the units of the division, but the ordnance officer will provide orders for ammunition against these credits to the unit ammunition trains when they need resupply.

The flow of requests for ammunition credits is just the converse of the flow of allocations in that they originate at the bottom and move to the top after being consolidated by each higher echelon. In the division, the combat elements transmit requests for ammunition to the ordnance officer. Normally, the requests are promptly filled from division credits in army depots but, before his credits are exhausted, the division ordnance officer requests the corps ordnance officer for additional credits. The reports of subordinate units are consolidated and transmitted to the next higher headquarters by each succeeding echelon. When the requests reach army, the ordnance officer of the army staff will act in compliance with instructions of the army G-4 and transmit necessary instructions to the regulating officer for moving ammunition forward from communications zone depots to establish new ammunition supply points or replenish stocks of those now in operation.

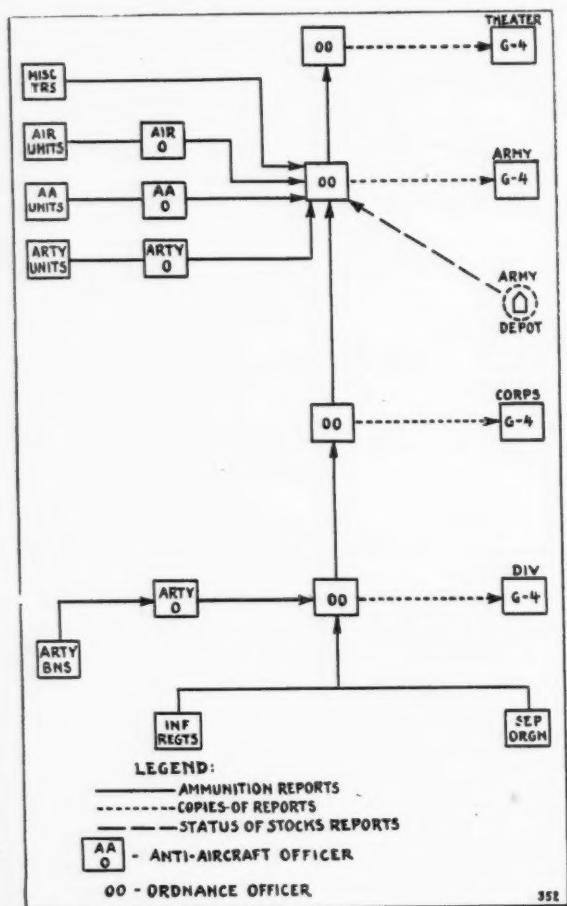


FIGURE 2.

Schematic Diagram of Flow of Ammunition Reports.

The schematic diagram in Figure 2 shows the course taken by periodic ammunition reports from lower echelon to higher echelon. In the division, the

infantry regiments and separate organizations submit reports directly to the ordnance officer. The artillery battalions submit their reports to the division artillery officer who in turn gives a consolidated report to the ordnance officer. Based on the reports received from the troops, his records of allocations made, and the reserves still on hand in supply points, the division ordnance officer prepares a consolidated report for the division which he transmits to the corps ordnance officer. In a similar manner each succeeding echelon prepares a consolidated report and passes it on to the next higher headquarters.

These channels of procurement, allocation, and distribution of ammunition are mentioned in order to illustrate the means higher headquarters have available for exercising control over ammunition supply in the division. The difficulties of ammunition supply make the provision of adequate quantities to all combat units a serious problem. Control is essential to insure that ammunition will be provided for the units that have the greatest need. This can be accomplished only through an accurate knowledge of stocks in ammunition depots and supply points, and the state of supply within the combat units. It is the task of the army ordnance service to see that ammunition reaches the combat troops, but the combat units themselves must fully understand the mechanics of ammunition supply and do their part to guarantee its successful operation.

Ammunition supply plans for the infantry division usually require consideration of the following factors:

1. Ammunition required.
2. Ammunition on hand.
3. Ammunition available.
4. Transportation available.

The many uncertainties present in any military operation make it impossible to determine ammunition requirements accurately in advance, but with experience in combat it becomes possible to estimate expenditures with reasonable accuracy. In estimating requirements for the infantry division it is normally only necessary to consider the ammunition required by the three infantry regiments and the artillery ammunition required by the division artillery. Actually there are other weapons in the engineer battalion, reconnaissance troop, and other units which make up the division troops. However, the expenditure of ammunition by these elements is so irregular and sporadic as to make an accurate estimate of requirements extremely difficult. Of course these troops will do some firing but it is highly improbable that their rate of expenditure will ever approach that of the infantry. Even if they do expend their ammunition very rapidly, the quantities involved are relatively small and resupply is not a serious problem. We know the division artillery has a number of pistols, carbines, and machine guns—

AMMUNITION SUPPLY IN THE INFANTRY DIVISION

but again the expenditure is very irregular and the quantities involved are comparatively small.

"Ammunition on hand" includes quantities on the individuals, with the prime movers and weapons carriers, on organic and attached ammunition trains, and in battery, battalion, regimental, and division supply points. Initially the units will have on hand just that amount of ammunition which has been issued to them as part of their basic load. The quantity of ammunition carried as basic load is a command decision and varies with the tactical situation and the amount of equipment and other supplies carried, as well as with the capacity of organic transportation.

The basic load of ammunition is an initial reserve intended to support the organization entering combat until resupply can be established. Thus, when an organization is about to enter combat, or is displacing during combat, it should be carrying an amount of ammunition equivalent to its basic load. Actually the ammunition carried as basic load may be the first to be expended but it must be replaced as quickly as possible in order to insure readiness for further combat. Presuming that an organization enters a phase of combat with its basic load intact, the objective of having a full basic load on hand at the end of the phase can be accomplished if the resupply during that period will just equal the expenditure.

"Ammunition available" depends on the credits set up for the division by corps and army. The number of ammunition supply points established by army depends on the tactical situation and the road and railroad net, but the division will normally have credits established at least two.

"Transportation available" includes organic infantry and artillery ammunition trains, vehicles of the quartermaster company, and any other organic or attached transportation that might be made available for hauling ammunition.

It is well here to point out that there may be a difference between the quantity of ammunition carried as basic load on a vehicle and that vehicle's capacity for resupply purposes. In addition to the basic load of ammunition, the vehicle may also carry personnel and equipment as part of its load. Therefore, the basic load of ammunition may be considerably less than full tonnage capacity. Once the combat position is reached, equipment unloaded, and personnel detrucked, the vehicle is available for resupply and for this purpose it can be figured at its full tonnage capacity.

The service company ammunition train of the infantry regiment is the normal means by which the infantry regiment resupplies itself during combat. This train is organized into three battalion sections and each section works closely with the battalion to which it is assigned. Headquarters company of the infantry regiment also has a small ammunition train which is intended primarily to serve its cannon

platoon, but there may be situations in which it will be advisable to pool the vehicles of this train with those of the service company ammunition train for resupply purposes.

The field artillery battalion ammunition train is part of the headquarters and service battery. Normally the train is divided into three sections (one for each of the firing batteries of the battalion) and, like the ammunition train of the infantry regiment, it is the normal means by which the battalion resupplies itself during combat.

Each field artillery firing battery has four gun sections and an ammunition section which is commonly referred to as the "fifth section." This fifth section primarily constitutes a small mobile reserve for the battery and it should not be used for resupply if a displacement of the battery is imminent. However, at night, in defensive situations, or for that matter in any situation where it can be assured that the fifth sections can make a trip to the ammunition supply point and be back with the battery before it displaces, it may be advisable to use these vehicles to assist in bringing up ammunition rather than have them remain idle at the gun positions. In such a case the fifth sections will usually be pooled with the vehicles of the battalion ammunition train.

The trucks and trailers of the division's organic quartermaster company form a pool of motor transportation to be used as the division commander directs. In many situations all or part of these vehicles may be used to haul ammunition and thus augment the loads carried by the organic infantry and artillery ammunition vehicles.

Consideration should be given to the possibility of using kitchen trucks and supply trucks for ammunition resupply purposes during periods in which they are normally inactive. In situations where the infantry and artillery ammunition trains alone can not bring in ammunition at the rate desired, these inactive service vehicles can dump their normal loads and be used to good advantage for hauling ammunition.

Normally, prime movers and weapons carriers will not be used for resupply purposes since to do so might immobilize the weapons they carry or tow. Of course there may be times when ammunition supply becomes so critical that it will be necessary to use prime movers and weapons carriers, and for that matter, all the staff cars or anything else available.

Because of the great tonnages, limited transportation facilities, and limited time, one of the biggest problems prior to any engagement will be to accumulate and maintain a sufficient quantity of ammunition within easy reach of the weapons to assure an uninterrupted supply during combat. In general, vehicles carrying ammunition initially will dump their loads in the forward area and commence hauling from ammunition supply points to build up a stock in the forward area sufficient to support the opera-

MILITARY REVIEW

tion. Analysis of this procedure shows that dumping of ammunition at a certain point or hauling ammunition to that point should be limited to such amounts as it is estimated will be expended from that position. If this ideal is attained, then the division can displace with its basic load intact and leave no unexpended ammunition in its old position.

The mechanics of ammunition supply in the infantry division can best be illustrated by means of an example.

Assume that an infantry division has just moved into the sector as indicated in Figure 3, and has been allocated an ammunition credit at ammunition supply point 16. (The ammunition supply point is an army installation and is established and operated by the army ordnance service.)

The accumulation of artillery ammunition prior to combat is of particular importance because of its great tonnage and the fact that heavy expenditures will usually occur at the beginning of any battle or operation. Artillery ammunition vehicles dump their loads in the vicinity of the firing battery positions and assemble for a trip to the ammunition supply point. The first step is for the ammunition train commander, or his representative, to go to the division ammunition office (DAO in Figure 3) and have a transportation order approved for the desired amount. If the amount desired is in keeping with

from which he is to draw his ammunition, and other pertinent information such as condition of bridges and roads, detours, etc.

It is not necessary for the train itself to pass by or stop at the division ammunition office. It is only necessary that the train commander or his representative visit the division ammunition office to get an approved order for the ammunition and then present this order at the ammunition supply point from which the issue is to be made. In some situations it may be possible for the train commander to visit the division ammunition office during the day and get a transportation order approved for ammunition which he will draw during the night.

After drawing the required amount of ammunition, the train commander should send a messenger to the division ammunition office to notify the ammunition officer that the ammunition has been drawn and to pass on any pertinent information regarding routes, conditions at the supply point, and other items of interest to train commanders.

In the case of the infantry—upon arrival in the forward area the regimental ammunition train will normally split up into battalion sections which dump their loads in the battalion areas, establishing battalion supply points. Initially these battalion supply points may be in the assembly area where the troops receive extra ammunition before going into the fight. Generally, they should be centrally located in the battalion sector and as far forward as the troops can move with safety, because from here forward the troops receive additional ammunition by means of carrying parties or weapons carriers.

After dumping their loads, the empty battalion train vehicles return to the regimental service area where they may be grouped with train vehicles of other battalions, or they may be sent back separately to the ammunition supply point where they will draw additional ammunition to cover anticipated expenditures and build up supplies—either in their battalion supply points or in regimental supply points in the regimental service area. The procedure in obtaining an approved transportation order and drawing ammunition at the ammunition supply point is the same as outlined for the artillery.

Frequently ammunition may also be accumulated in division supply points farther to the rear, especially in those cases where it is not considered appropriate to establish individual battalion or regimental supply points due to the uncertainty of lines of contact or the possibility that regiments may be committed to a sector which is not definitely determined.

In the interest of secrecy it is desirable to accumulate the bulk of this ammunition under cover of darkness and reduce daylight hauling between the ammunition supply point and the forward area to a minimum. If this is impossible, of course ammunition trains will return to the ammunition supply

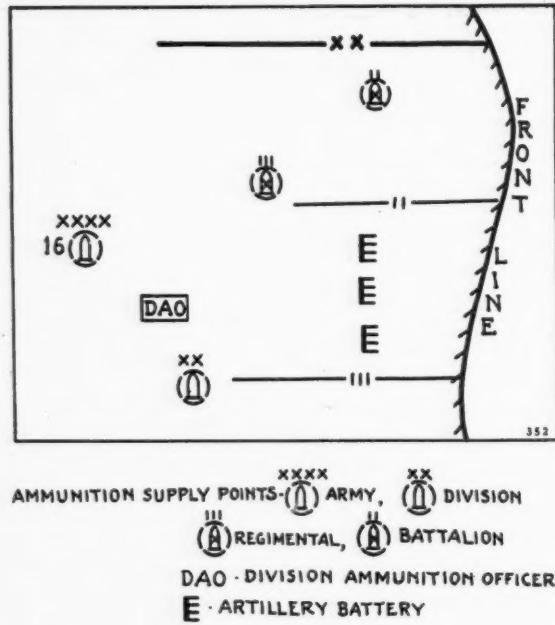


FIGURE 3.

the instructions and policies of the division commander, the ammunition officer will approve the transportation order. The train commander can then present the approved order at the ammunition supply point and draw ammunition against the division's credits at that point. In addition to getting his transportation order approved, the train commander will be given the location of the ammunition supply point

AMMUNITION SUPPLY IN THE INFANTRY DIVISION

point during daylight. In some situations where time is short and the ammunition trains can not build up sufficient reserves, we may find other division transportation being made available to haul ammunition.

To summarize: the salient features of ammunition supply are covered by the following principles:

1. Ammunition should be brought as far forward by truck as the situation will permit to reduce physical effort and save time.

2. Rehandling of ammunition loads should be kept to a minimum for the same reason.

3. Ammunition dumped in forward supply points should be kept to the minimum expected to be expended from that position to avoid the necessity of picking up excess ammunition when the weapons displace.

4. Ammunition loads should be kept as mobile as the transportation situation will permit.

5. Weapons carriers and prime movers should be used cautiously for hauling ammunition and in any event should generally not be sent farther to the rear than battalion supply points for fear they will not be available when the time to displace the weapons arrives.

6. Except in an emergency, ammunition vehicles should not be used for any other purpose.

7. At the conclusion of any operation, a unit's basic load should be intact; in other words, sufficient ammunition should be brought in for any operation to cover anticipated expenditures so that the basic load (which should be considered as an initial reserve) will remain intact after the operation.

The German Air Force in a Winter Battle

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas,
from a German article in *Luftwissen* February 1943.]

SINCE NOVEMBER of last year a winter battle of unusual severity has been going on in the southern sector of the eastern front. The Soviets are trying to crush the German defensive front with strong infantry and tank forces in unceasing attacks.

The German air force, proved in numerous campaigns as a pronounced offensive weapon, stands side by side with the army forces in defense in this winter battle. The use made of it differs from that of the past summer, because even the operations in the air must proceed under the harsh conditions of the eastern winter. To be sure, the winter weather with its frequent snowstorms and low-hanging clouds does not limit flying itself very much, but rather it limits the tactical utilization of the air arm. Large operations with massed forces [probably massed aircraft is meant here—Ed.] are rarely possible. Under poor conditions of visibility, such as blowing snow for example, rolling attacks of strong air formations are necessarily excluded, and combat activity must be limited to the use of a few individual fliers. Bad-weather flying is not unfamiliar to the German fier, thanks to his good training and the technical equipment of his plane. Even at that, the conditions of winter weather in the east frequently exclude, for instance, the use of dive bombers, and thus make more difficult the effective struggle against hostile armored vehicles.

The winter weather lowers the fighting power which is native to the air force and which was evident in the many battles of the past summer; this fact cannot be overlooked. Nevertheless, the German air force has played a dominant part in the winter battles on the eastern front in denying a decisive result to the Soviet attack. The character of these battles, with the formation of the strong points and hedge-hog positions distinctive of German combat method, demanded the accomplishment of especially difficult tasks particularly on the part of the flying formations of the air force. Besides

most intensive combat use in support of the troops of the army, the supply of advance strong points with provisions and ammunition constituted an important and extensive part of the employment of the air force. The greatest accomplishment in this connection is the weeks-long supply of the 6th Army encircled in the area before Stalingrad.

Night and day, and across territory occupied by the enemy, the transport formations flew to bring the most necessary supplies for the army. Often without fighter protection, or forced to low-altitude flight by meteorological conditions and exposed to the hostile antiaircraft defense, the transport fliers fulfilled the most difficult problems ever given them. Although the supply of Stalingrad by air demanded the greatest efforts and heavy losses, it was continued not only until the last possibility of landing among the defenders had disappeared, but also until the dropping of ammunition and provisions had become impossible because of the narrowness of the battlefield.

An antiaircraft division of the air force also stood to the last man beside the army in Stalingrad. As ammunition became scarcer, the antiaircraft gunners had to give up fighting the enemy in the air and save their last shells for defense against tanks; and they stood with rifle and hand grenade in the ranks of the grenadiers, who did their duty to their last breath.

The fierceness of the struggle often enough gave the ground crews of the flying formations the task of defending their landing fields against hostile units who had broken through, and of covering the transfer of their formations with weapon in hand.

Even if the air force could not prevent the sacrifice of the 6th Army, it helped nonetheless in carrying out the task assigned to the warriors of Stalingrad: to hold the enemy until the defensive front in the south was again established.

An SOP for Summary Courts

MAJOR WILLIAM H. EDWARDS, *Adjutant General's Department*
Adjutant General, Command and General Staff School

WHAT IS a Summary Court? What is his mission? In the event you are appointed a Summary Court for the first time, do you know how to proceed?

The *Manual for Courts-Martial* is replete with information on what a Summary Court should do, but is strangely silent on *how* it should be done.

In retrospect, the writer's maiden trial as a Summary Court was a travesty which left the accused somewhat dazed and thoroughly bewildered. It is certain that the accused was more severely punished by the trial than by the sentence. Such situations are unnecessary and unwarranted and should be avoided. We must bear in mind the statutory prohibition against "cruel and unusual punishment," which applies equally to trials and sentences.

There is set forth below an SOP which has been followed with some degree of success. In reality, this is a streamlined version of general and special court procedures with obvious modifications. In some instances, the matter included is pure dictum, and should not be regarded as authoritative. On the whole, the procedure is presented merely as a guide, and should be so regarded.

Study your case well before setting the time for trial. Examine the charges and supporting papers carefully. Refer to the discussion and proof of the offense charged in the Manual. Make notes of salient points. Turn to Tables on pages 97-101 MCM and determine the allowable punishment for the offense charged.

Set the time of trial and fix the place of assembly. Be sure to inform the accused as far in advance as possible, and determine whether he desires any witnesses called to testify in his behalf—this saves time and avoids delay after the trial has begun. Notify all witnesses, both for and against the accused, of the time and place of trial. In case a witness is an enlisted man, make your request for his attendance through his organization commander. If civilian witnesses are to be called, you have power to *subpoena*, but ordinarily civilians will appear upon informal request. Depositions may be taken if necessary. A reporter is unnecessary and unauthorized. Formal service of charges on the accused is not required.

At the appointed time of trial, arraign the accused. This is accomplished by reading all matter contained in pages 2 and 3 of the Charge Sheet. This informs the accused of the offenses alleged, his accuser, and that the charges were sworn to according to law and referred to you for trial by competent authority. It

is well, at this point, to ask the accused whether he fully understands the offenses alleged against him. If his answer is negative, explain the gist of the offenses in *non-technical language*.

The accused should be asked whether he has any special pleas. (These include pleas in bar of trial and pleas to the jurisdiction, and are covered in detail on pages 50-54 MCM). If a special plea is entered, a ruling must be made before proceeding with the trial. Remember, you are representing both sides of the case and it is your duty to enter a special plea for the accused, if such action is indicated.

If the accused enters a plea of "guilty," the meaning of such a plea must be explained to him as required by Paragraphs 70 and 82 MCM. After this explanation, the accused should be permitted to change his plea to "not guilty," if he so desires. If the accused desires his plea of "guilty" to stand, it is permissible to proceed immediately to a finding and sentence without introduction of evidence. However, to afford some idea as to the degree of aggravation or extenuation, testimony may be heard to insure an adequate sentence. If the accused declines to plead or "stands mute," a plea of "not guilty" must be entered for him. A plea of "guilty" with reservations or other qualifications should be regarded as a plea of "not guilty."

The matter of pleas disposed of, you should now proceed with the introduction of evidence. All witnesses must be sworn. It is desirable first to hear the witnesses for the prosecution. Remember your duty to cross-examine witnesses, since you represent both sides of the case. The accused should be asked whether he desires to cross-examine each witness personally. Rules of Evidence prescribed in Chapter XXV, MCM, must be followed.

In all trials by Summary Courts it is better practice to advise the accused of his rights: that he may remain silent, and that if he elects to remain silent this fact will not create any presumption against him; that he may take the stand as a witness, in which event he will be subject to cross-examination; or that he may make an unsworn statement, oral or in writing or both. Care should be taken that the accused understands these rights and is afforded full opportunity to exercise them. (Paragraphs 75a, 76, and 120d, MCM, 1928.)

Now proceed to a finding. Weigh the evidence carefully and with an open mind. Try to be unbiased and bear in mind that proof must be "beyond reasonable doubt."

AN SOP FOR SUMMARY COURTS

If your finding is "guilty"—consult your notes as to the punishment allowable for the offense. Study the military record, age, rate of pay, allotments, etc., on the face of the Charge Sheet. Admissible prior convictions by Courts-Martial should be considered. Do not be swayed by *sympathy* or *prejudice*. Adjudge a sentence which in your opinion will best serve as a deterrent. Never consider adjudging a sentence to serve as a "horrible example." Maximum sentences should be given only in the most aggravated cases.

Before passing sentence it is well to "talk it over" with the accused. In a kindly way, point out ways to avoid involvement in the future; that the authorities would far rather reward a soldier than punish him. Appeal to his emotions—his sense of duty. If this appears futile, appeal to his intellect. Employ such statements as "You appear to be an intelligent person," or in appropriate cases, "You don't look like a dumbbell to me." Surprisingly, these talks seldom fail to bring results. On one occasion, an accused, whose emotions had been completely aroused, interrupted the conversation by pleading, "Please, sir, tell me the sentence, never mind the lecture!" These talks are purely advisory and are not punishment.

After passing sentence, there remains the detail

of preparing the record. Information concerning the preparation of your portion of page 4, Charge Sheet, may be found in Appendix 8, page 272, MCM. Sign and deliver all three copies of Charge Sheet to the commanding officer for his action. This is the only record required to be kept.

Army Regulations prohibit tyrannical and capricious treatment of a subordinate. Further, they prescribe that military discipline is administered with kindness, with firmness, and with justice. Maintain dignity and decorum. Never allow your trials to become perfunctory. Do not countenance levity. It is your duty to make the accused feel that he is receiving a fair and just trial. Convince him that he has had his "day in court."

In conclusion, yours can be a substantial contribution to victory. Yours is the job of preventing petty offenders from becoming chronic and serious offenders. Here is a golden opportunity to exhibit true leadership. Can the degree of your success be measured? The answer is obviously affirmative. It normally can be measured by the number of trials—whether it has increased or decreased. If petty offenders repeatedly reappear before you—you have failed.

The Eight Principles of War as Applicable to the Platoon Commander's Job

[From Canadian Army Training Memorandum No. 22, as reprinted in Army Training Memorandum (New Zealand) No. 78.]

1. *Maintenance of the Object*.—Never forget your job. Remember you are here to turn out a platoon of fully competent soldiers. Stick to it night and day. Before you take time off—think. Is there anything you slacked on that you could make up now! Time lost can never be regained; keep on the job.

2. *Concentration*.—Are you using all the stores available to you for the job? Are you wasting time on useless "palaver and bitching?" Are your NCO's doing their best, are they concentrating on the job? Do you find yourself for hours in the mess? Put all your excess time and energy on your job—that's where it does the most good!

3. *Economy of Force*.—Don't send a man to do a boy's job, a boy to do a man's job. Distribute your NCO's to the best advantage. Keep your men fit, in camp a full strength platoon each day. See that your men get only a fair share of fatigues—training is the thing.

4. *Offensive Action*.—Don't dodge your problems, sink your teeth into them and tear them apart. Work hard! Think hard! Play hard! You are in this thing to win! Give it everything you've got! When the day is done, and you're dog tired, the Officer in Command's a grouch, the Adjutant is cracked, and the Company Commander a bloody fool—forget it! Be a man and give that extra bit to show the world you are.

5. *Surprise*.—Get a new idea; surprise the Commanding

Officer with a bright suggestion. If you are shy and distant with the platoon—surprise 'em. Show them that you are human. If your crowd is slack—surprise 'em. Show them you can crack down. Bowl them over with something new—if it makes sense, you can keep them interested every minute.

6. *Security*.—Keep your mouth shut; train your men to do the same. Don't be a cad; your rank and appointment gives you the dangerous privilege of knowing information on which may depend the lives of thousands of men; if one dies because you talked, his blood is on your head, you have dishonored your rank and betrayed your country's trust in you. Be thoughtful! Be cautious! Be honorable!

7. *Cooperation*.—Do your job with regard to the jobs of others. You are a small cog in the machine, but if you don't clock, the whole machine is out. Think before you curse the Quartermaster, he's human; think before you call the Medical Officer a bloody fool, he only has two hands and a small staff. Remember the Adjutant is a harassed, careworn individual; when he wants information get it fast and straight. Learn to work with others and they'll work with you.

8. *Mobility*.—Keep your mind open and agile. Don't become a slave to Manuals and Pamphlets. Learn to meet the situations as they arrive and be alert to change your plans accordingly. Remember a fast mind is often better than a fast vehicle—out of it comes the practicable application of all the other principles.

Rehabilitation Centers

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THE RECENTLY activated program of rehabilitation is designed to draft all available manpower out of our military prisons and put it back to work. In our present situation, in spite of the demands of justice and discipline, we can't afford to allow thousands of men who are not actually dangerous to society to spend the war in confinement.

True rehabilitation involves changing a man's disposition and character, and it's apparent that you can't do that in one month or six months. Nevertheless there are some things that can be done in a short time; some of these are "probable," others are "possible." In this effort toward rehabilitation we are giving the "possibles" the benefit of the doubt. More often than not, from the individual point of view, the trouble starts with the proverbial square peg being forced into a round hole. Unquestionably great improvement has been effected in this connection through the classification efforts of Reception Centers and Training and Replacement Centers. The large majority of men are being fitted into jobs which are within their physical and mental capabilities. However, with the tremendous growth of the army, the small percentage of misfits becomes an important figure. It is the business of the Rehabilitation Center to discipline these misfits; to trim down the corners of the square pegs as far as seems practical and then find a job that fits. This year the restoration throughout the entire nation will approach 5,000 men.

Every one concerned agrees that a large percentage of the restorations made by Rehabilitation Centers do not and cannot involve true rehabilitation. At the same time if these restorations provide a considerable amount of good work in the army before some of the individuals break down and "go haywire again," then the program has justified itself. In order to canalize our thinking, the term "rehabilitation" is given a special, non-technical definition.

For our purpose, rehabilitation is "*The process of rebuilding the habits and attitudes of a prisoner through discipline, training and pertinent education to the extent necessary to justify his return to duty in the shortest possible time.*" As expressed in a directive of the 7th Service Command, "The purposes of the Rehabilitation Center are: First to discipline by confinement at hard labor the individual for his failure to conform to established standards of behavior within the Army and, Second, to instruct and train those worthy, pointing

toward their restoration to duty as soldiers and useful members of the armed forces. *The ultimate objective is that usable manpower be not lost to the army.*" Notice the first part of that directive—"first, to discipline by confinement at hard labor." A recent comment by a responsible staff officer shows the trend of thinking about confinement and hard labor. It was to the effect that possibly it is just as hard labor, and probably harder labor, for our misfits to do some thinking and a lot of military training as for them to break rock. Our latest information on the subject indicates a considerable variance in procedure relative to the question of hard labor, but it is becoming apparent that as the war proceeds and the demand for manpower becomes ever greater the tendency is to devote more and more time to military training.

The authorizations and directives for the establishment of the Centers are few—and recent. Their administrative history includes the following: Basically AR 600-375 which states, "The authority competent to order the execution of the sentence of a Court-Martial may, at the time of the approval of such sentence, suspend the execution, in whole or in part, of any such sentence which does not extend to death, and may restore the person under sentence to duty during such suspension; and the Secretary of War or the Commanding Officer holding General Court-Martial jurisdiction over any such offender may at any time thereafter, while the sentence is being served, suspend the execution, in whole or in part, of the balance of such sentence and restore the person under sentence to duty during such suspension." Next, a letter from Headquarters, Army Service Forces, on 28 October 1942 to Commanding Generals, all Service Commands (except the Northwest), directing that each of them "establish a Detention and Rehabilitation Center" (the word "Detention" has since been dropped). This directive contains several outstanding points.

1. Only certain types of prisoners go to the Rehabilitation Center.
2. Centers are patterned after but not part of the U.S. Disciplinary Barracks at Fort Leavenworth.
3. New construction is prohibited.
4. Instructions are included to liberalize arrangements for restoration and to cut down the number of Courts-Martial.

Following this directive the War Department issued a series of circulars to define the types of prisoners who are to be confined in the Rehabilitation Centers, in the U.S. Disciplinary Barracks, and

REHABILITATION CENTERS

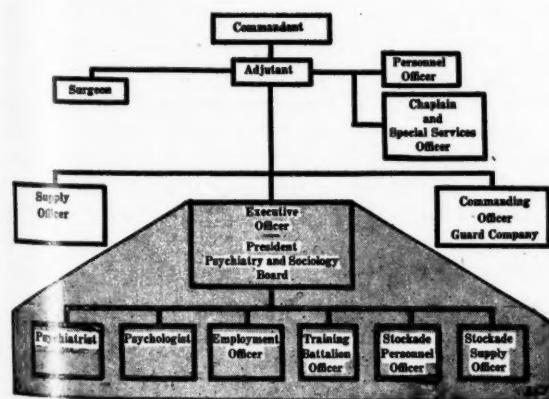
in Federal Penitentiaries. The current circular is No. 63, 1943, which specifies that all general prisoners who have more than three months to serve and who do not fall into certain specified groups (traitors, drug addicts, perverts, murderers, arsonists, etc.) are to be confined at the Rehabilitation Centers. In compliance with the letter from the War Department and the succeeding circulars, the commanders of the several Service Commands issued their own orders establishing the Centers and designating their locations. All were originally established to accommodate 500 prisoners.

The places are as follows:

1st Service Command	Fort Devons, Massachusetts
2d Service Command	Camp Upton, New York
3d Service Command	Camp Pickett, Virginia
4th Service Command	Fort Jackson, South Carolina
5th Service Command	Fort Knox, Kentucky
6th Service Command	Fort Custer, Michigan
7th Service Command	Camp Phillips, Kansas
8th Service Command	Camp Bowie, Texas
9th Service Command	Turlock, California

At the present time each of these Centers is operating by and under authority of these few directives, and speaking generally, all nine of them are working well. They are absorbing the load which was becoming too great for the U.S. Disciplinary Barracks—and they are returning soldiers to service. Some of the restorations will not stick, but a lot of them will.

On activation each Center was set up with a cadre of officers, a station complement, and a guard detachment. The organization of one of the Centers is shown on the accompanying chart. The unshaded portion is similar to the organization chart of any other small headquarters. Notice particularly the officers along the lower part of the chart. Their duties are especially adapted to accomplish the purpose of the Center.



The main job of the Stockade Personnel Officer is the reception of prisoners. This includes a strip, search, and shower, taking custody of their personal property, taking and turning in their clothes, issue of prison clothing, and an orientation lecture. He is responsible for billeting, mess, and general personnel administration. He is a member of the Area Parole Board, the Board for Investigating Escapes, and the

Board of Psychiatry and Sociology. After the quarantine period he assigns the new prisoners to the "General Prison Population" where they put in one hour a day at military training and eight hours at hard labor.

The Employment Officer classifies the prisoners for work, makes up the details, supervises the work, obtains reports from guards on prisoner attitudes, and consolidates them for the Psychiatrist. You see here the effort which is made to put the prisoner in a job that fits—and the follow-up to see how it's working. This officer also arranges for limited prisoner recreation and is the area parole officer.

The Training Battalion is the next and probably the last step in a prisoner's journey through the Center. The men of this outfit have more privileges than the others—they wear a uniform (Class B) without insignia and they may salute officers (and you'd be surprised to see how they go out of their way to salute them). They spend nine hours each day on military training—and they get pretty good at it. The Training Battalion Officer, in addition to his other duties, is responsible for planning and supervising all of this training. He makes individual progress reports and makes provisions for special individual training where indicated. This officer is also responsible for stockade security and the investigation of escapes.

The Psychiatrist is responsible for analyzing all prisoners and weeding out those who can never be restored with a chance of success. His most important contribution is the Psychiatric and Sociological (P&S) Report. This report is started just as soon as the prisoner arrives at the Center and may take from one month of six to complete. By interview the Psychiatrist obtains from the prisoner the names and addresses of his parents, teachers, previous employers, ministers and commanding officers, and other acquaintances; he also finds out where the prisoner has lived and how long in each place. Then he sends letters to these people, trying to find out all that is known about the individual. Reports from the other departments in the Center have come to him also and he keeps close track of the prisoner's behavior and attitude during his confinement. Eventually he produces the P & S Report, including his recommendation. These are presented to the P & S Board (of which he is a member) for their consideration in recommending a final disposition to the Commanding Officer.

The Psychologist assists in the work we have just discussed, in addition to carrying out various other responsibilities. In particular he takes care of the Army General Classification Tests and the intelligence and aptitude tests. He observes and reports on prisoner attitudes and recommends work assignments to the Employment Officer.

Now to look for a few minutes at the soldier whom we are planning to rehabilitate. What sort of a per-

MILITARY REVIEW

son is he? What has he done to make himself a likely prospect? In the first place, perhaps he didn't want to join the army anyway—he was forced in by his Selective Service Board or by public or family opinion, and in the rush and congestion at the Draft Board and the Induction Station, his physical and mental deficiencies were overlooked. As an average his Army General Classification Test rating (Raw Score) was around 65-70. He is about 25 years old, has had 7 years schooling, and his early home life and environment have not been good. There's a 50-50 chance for him to have come from the farm or from the city. The chances are two out of three that he has been convicted of desertion or absence without leave and he has been sentenced to serve more than three months in confinement at hard labor, to be followed by a dishonorable discharge. This discharge has been suspended until the time of his release from confinement. Let us consider these men in a more specific light—that of the psychiatrist. Technically (but not too technically) they fall into the following groups—the percentages are approximate only. About 45% are CPI (Constitutional Psychopathic, Inferiors) which means that, in varying degree, they "show a life behavior pattern of incapacity for responsibility and inability to adapt to adult social, moral, ethical and economic requirements." These individuals can often be rehabilitated to the degree that warrants restoration. They probably will adjust for a sufficient length of time in military service to be an asset rather than a hindrance to the war effort. Their chances for permanent rehabilitation are poor, and their condition cannot be cured. Some 4 or 5% are mentally deficient—there isn't anything to do with these people except discharge under Sec 8, AR 615-360, "Habits or traits of character undesirable in the military service." They shouldn't have been accepted into the army in the first place, and having been mistakenly accepted should be discharged as soon as recognized. They cannot be rehabilitated to valuable service. About 10% are "psychoneurotic." These are the individuals who are full of aches and pains for which no reason other than mental can be found. Some of these may be rehabilitated and restored to duty with a fair chance of success. In severe cases, however, a discharge under Section 8, AR 615-360, is the only practical answer. Some 5% have physical disorders which disqualify them for military service. They must be given a Certificate of Disability Discharge. About 5% are victims of miscellaneous troubles which may or may not be possible of correction. The remaining 30% are judged normal—physically and mentally. Their trouble may be a hasty or violent temper or some similar attribute. This class of prisoner is the best prospect for true rehabilitation. All of them may be expected to return to duty—and most will stick.

Actual practice indicates that about 90% of military prisoners wish to return to duty. It must be

recognized, however, that the mere desire for duty is not an adequate index of the desirability of returning the individual, nor of the possibility of having him stick if he is returned. It must be remembered that the man himself is the important thing, and that he must be judged in so far as possible solely on whether or not he can be restored with a fair chance of proving an asset to his organization.

We are interested in only one thing—returning each prisoner to duty if and as soon as it is reasonably possible—and if we're not sure it's reasonable, give the man the benefit of the doubt. To repeat, "The ultimate objective is that usable manpower be not lost to the Army."

There are a number of problems which have arisen concerning this program besides the obvious ones involving the many different types of individuals who must be dealt with. We will not attempt to cover all of these, nor to give the answers. There are no "school solutions." Each must be decided by the people who are responsible according to their own best judgment. And the basis for that judgment must be the question—How is the army best served? The general opinion is that the need for manpower is paramount and that other considerations must be secondary. It is no doubt for this reason that we find the changing attitude in connection with the restoration of prisoners. A few years ago the policy at the U. S. Disciplinary Barracks was never to restore a man to duty unless they were sure he would stick. During this peaceful period the DB probably restored no more than 5% of its prisoners—but with few exceptions, they stuck. At the present time they are restoring about 30%—the figure may go to 50% this year. One of the Service Command Rehabilitation Centers is presently restoring better than 90%. Everyone concerned knows that a considerable percentage of these men have not in fact been permanently rehabilitated—in some cases they may not have been rehabilitated at all. However, the policy is dictated by the pressure for men, and many of these men, while not A-1 soldiers, will be of some value and therefore must be used. Still another problem is the question of whether a man should serve a third of his sentence before being considered for restoration. AR 600-375 admits the possibility of either requiring this or not. The Disciplinary Barracks now does require it. To the best of our knowledge none of the Service Command Centers does. The question of how to get rid of those men who cannot be restored has proven something of a problem—an administrative problem which is now being worked out. All in all there are still a lot of questions—but the main thing is that the Centers are now returning men to duty in large numbers; and these restored soldiers are trained, fit, and able to take their places in their new organizations, it being the policy of the War Department for General Prisoners not to be returned to their previous organizations.

Engineers with the Army Air Forces

BRIGADIER GENERAL STUART C. GODFREY, *United States Army*
(Reprinted from *Aviation Engineer Notes* January 1943.)

IN EACH CAMPAIGN of this war the importance of airdromes has been freshly demonstrated. In the Japanese southward advance into the Philippines, Malaya, and the Dutch East Indies, airfields have obviously been the stepping stones whereby the Japanese air forces were able to support effectively the advance of sea and land forces.

The rapid development of our own Army Air Forces has included provision for an engineer component of troops especially trained and equipped for the function of providing field airdromes. This was touched upon as follows by General H. H. Arnold, Chief of the Army Air Forces, in a talk to the Washington Post, Society of American Military Engineers, on October 27, 1941—later published in the December number of the *Military Engineer*.

"Finally, and this is where the military engineer enters the picture, air bases are a determining factor in the success of air operations. The two-legged stool of men and planes would topple over without this equally important third leg. Hitler failed in his attempt to destroy the R.A.F. largely because the engineers had provided England with a wealth of camouflaged, easily repaired, and widely dispersed landing fields which offered a hopelessly decentralized target and enabled the R.A.F. to keep its fighters almost continuously in the air. On the other hand, you know what happened to the R.A.F. when it lacked airdromes in Crete.

"We in aviation have always respected the engineer, and appreciated his intelligent assistance in our problems. But it is clear that we military pilots can no longer classify the military engineer as an assistant. He is one of us."

The building of many new permanent airdromes, in the United States and its overseas possessions and bases, is now one of the important activities of the Corps of Engineers, acting through its Division and District Engineers. But for a theater of operation, in war, a different type of airfield construction must be visualized. This may involve the emergency expansion of existing air bases by the provision of auxiliary airfields, smaller and better concealed. Again, it may be pioneer work in some new and distant theater. In any event, there will be a vital need for engineer troop units with the Army Air Forces. The need has become far more extensive and more specialized than in World War I days. The former small grass plot has been replaced by an extensive tract of land, cleared of obstacles, and with all-weather use facilitated in many cases by paved runways. For this work, troops with special equipment

and special training are needed. Moreover, an air force, like a field army or an armored force, needs its own engineers—troops who have trained with it intimately, who speak its language and understand its needs.

These engineers with an air force must be trained and equipped to construct rapidly advanced military airdromes, or to improve existing ones. They must be skilled in the camouflage of airfields, and the construction of defensive works. They must be organized and prepared to repair instantly fields damaged by enemy bombing. Finally, with their trained riflemen and machine gunners, they must be prepared to take an active part in the defense of airdromes. Such is the concept of aviation engineers—troops who are trained to construct, conceal, maintain, and defend military airdromes. These troops must be prepared to accompany or even precede an air task force to a theater of operations.

The first troop unit formed for special work with the Army Air Forces was the 21st Engineer Regiment, organized at Langley Field, Virginia, in June 1940. This unit has been the parent organization of many of the existing aviation engineer units. The manifold activities of this regiment have included work of construction on their own barracks and grounds, experimental work on runways including steel mats, and the development of techniques for camouflaging airdromes. The regiment has furnished the personnel and equipment for two sizable detachments to carry out important task force missions.

THE TASK

To visualize a military airdrome in war, we need to differentiate it sharply from the usual commercial airport or permanent peacetime Air Corps Station. The latter offers a conspicuous and vulnerable target to enemy bombers. By great effort it can be rendered less conspicuous. But preferably an air force will operate from smaller auxiliary fields. Such fields lend themselves better to camouflage. Planes on the field, instead of being huddled on a parking apron, are dispersed in pens around the periphery of the field or in adjacent fields, made accessible by a taxi-track. Servicing installations are simpler and are also dispersed and concealed.

In connection with such airfields, the tasks for aviation engineers may be described as follows:

Improvement and provision of advanced airdromes, including landing fields with runways, taxiways, hard standings, and dispersed positions.

The necessary housing, water supply, lighting, and

MILITARY REVIEW

sanitary facilities for all personnel assigned to the field.

Facilities for servicing and arming of aircraft, defense installations, and protective structures.

The rehabilitation of captured airdromes either through the use of Airborne Engineer Battalions or the regular Engineer Aviation Battalions.

Assistance in the camouflage of advanced airdromes and appurtenances and all other Air Force installations.

The assistance in the defense of advanced airdromes against air and ground attack; passively, through camouflage and the construction of defensive structures, road blocks, etc.; actively, through tactical employment as an integral part of the defense scheme.

The maintenance and repair of airdromes, particularly after damage by enemy attack.

Demolition of existing airfields and appurtenances.

Improvement or provision of routes of communication to airdromes and other Army Air Forces installations.

It is seen that these tasks require that aviation engineers be both technical specialists and combat soldiers. Airports are usually located well behind the front line, and the combat function will be the exception rather than the rule. But in the future, no airport in a theater of operations will be entirely secure against either a raid by armored forces, or the increasing threat of vertical envelopment. Engineers, with trained riflemen and machine gunners, thus constitute an important element of defense. Events overseas have proved that good riflemen are particularly valuable in dealing with parachute troops, so vulnerable during their initial landing. In one theater our Aviation Engineers have already successfully defended the field they built against ground attack.

THE FIELD AIRDROME

The scope of this article will permit only a very brief description of military airdromes. For details, reference is made to Colonel R. E. Smyser's article in the *Military Engineer* for December, 1941, on "Airdromes for War," and to the tentative Technical Manual for Aviation Engineer Troops prepared by the Engineer Section, Air Force Combat Command (to be shortly replaced by an official manual).

Runways.—The first requirement of an airdrome, obviously, is an adequate landing and take-off area, which may vary from a single turf strip to an elaborate system of hard-surfaced runways. For the modern heavy bomber, with its increasing weight, the hard-surfaced runway is becoming almost a necessity.

Runway lengths have been steadily increasing, with the increased weight and landing speeds of modern planes. Three thousand feet may be considered a minimum even for observation planes.

The modern fighter plane, landing at upwards of 100 miles an hour, should have 4,000 feet or more. For the fast and heavy bombers now being built, 5,000 feet and more is needed.

The conventional geometrical runway patterns of our permanent air bases have no place in the field airdrome, in laying out which much attention should be given from the beginning to concealment and camouflage. Runway strips should be contiguous but preferably not intersecting, and the clearing designed to give adequate width to landing strips should not extend to the whole area.

Taxi-tracks.—Equal in importance to the runways are the taxi-ways which permit their full utilization. These paved strips, constituting a "perimeter taxi-track" or the equivalent, give convenient and speedy access to the ends of runways from the areas where the aircraft are parked.

Dispersion.—The vital need of dispersing airplanes on an airdrome no longer needs to be demonstrated. This requires hard standings around the landing area, or in adjacent fields, with the maximum of concealment, and often protective pens or "revetments." These splinter-proof pens are particularly desirable for pursuit planes, which must be parked relatively close to the runways in order to facilitate their speedy take-off. Bombardment and observation planes, which do not need to take to the air so rapidly, can be dispersed at greater distances.

Servicing Facilities.—The second requisite for every operational airdrome comprises the essential facilities for servicing the planes, with storage for gasoline, ammunition (bombs and small arms ammunition), and chemicals. In the field, reliance must often be placed on dispersion and concealment of gasoline tanks, instead of the underground storage provided at air bases. Bombs will be stored in dispersed storage piles, protected by splinter proof revetments. Large, elaborate hangars present an attractive target, yet since overhead cover is required for major repairs, one simple steel-frame hangar will usually be provided to house only those planes which are under repair. Such a hangar has been recently developed by the Engineer Section of the Headquarters, Army Air Forces. Light, power, water supply—the need for these facilities is obvious.

Administration and Control.—The operation building with its communication facilities, nerve center of the airdrome, is so important as to deserve protection against small arms fire and bomb splinters. Other administrative buildings are relatively less important, and personnel therein can take cover in air raid shelters conveniently located.

Except for personnel on 24-hour duty on the airdrome, all living, messing, and recreational buildings should be well away from the landing field. One satisfactory solution is to group the messing and recreational facilities at one site, perhaps half a mile from

ENGINEERS WITH THE ARMY AIR FORCES

the landing field, with living accommodations in organizational groups some hundreds of yards from this communal center.

Defensive Installation.—Not of least importance are the defensive works on an airdrome. The defense of an airdrome, against attack by air, land, and sometimes sea, presents a difficult problem,—the importance of which was attested in Crete, where the capture of the Maleme Airport had so decisive an effect.

Defensive installations may be of many types. Elaborate concrete pill boxes and other works arranged around the perimeter of a landing field tend to be conspicuous and to attract bombing. The tendency is toward simpler field works, camouflaged with utmost care. Obstacles to block hostile approach, and plans for the demolition of the airdrome, in case its capture becomes imminent, are also engineer tasks in the defense.

Camouflage.—The camouflage of an airdrome, though mentioned here at the end, is something that must be planned from the beginning—in layout as well as technical treatment. Sometimes it must suffice merely to render an airdrome less conspicuous by reducing contrasts and blurring outlines. Sometimes the airdrome may be made to resemble something else—its runways disguised by false roads and hedges and other patterns. And finally, resort may be had to constructing a dummy airdrome some distance from the real landing field, and thus draw the enemy away from the target he seeks. A successful example of airfield camouflage will be described later.

ORGANIZATION AND EQUIPMENT OF AVIATION ENGINEERS

The Engineer Aviation Battalion, T/O 5-415, is the basic engineer construction unit of the Army Air Forces and is composed of a Headquarters and Service Company and three letter companies. It was organized to provide twenty-four-hours-a-day operation of its equipment. The battalion is designed to be capable of independently constructing an advanced airdrome and all appurtenances.

The largest unit is the Engineer Aviation Regiment, T/O 5-411, consisting of a Headquarters and Headquarters Company and three battalions. Battalions are identical with the regular Aviation Engineer Battalion and they are capable of independent operation. The Headquarters Company has a great deal of heavy equipment not contained in the battalion. This unit is designed to perform a large volume of work in a fairly concentrated area.

A recently formed type of unit is the Airborne Aviation Engineer Battalion. The battalion consists of one Headquarters and Headquarters Company and three lettered companies. The unit and all its equipment are designed for airborne operation. It is capable of taking over and putting in operating condition captured enemy airdromes, if need be those seized by other airborne troops behind the

lines. This light equipment and organization also fit it for landing operation.

Specialists units of the Aviation Engineers are the Engineer Aviation Topographic Companies, T/O 5-447. This unit functions in the making of aeronautical and target charts from aerial photographs taken by the photographic groups of the Air Force. It works in tandem with the photographic group and is provided normally on the basis of one per photo group.

Engineer Aviation Camouflage Battalion, T/O 5-95. This unit is composed of a Headquarters Company and three lettered companies. This unit furnishes technical assistance, supervision, and control for the camouflage activities of all Army Air Force units in a theater of operations in connection with the design, planning, and execution of their camouflage works. It fabricates and supplies camouflage materials from local sources when the situation calls for such operations. It carries on experimentation for new camouflage methods and assists in the training of all Army Air Forces units in a theater of operations.

Engineer AF Headquarters Company, T/O 5-800-2, is composed of three platoons. This organization is attached to an Air Force Headquarters and operates under the Air Force Engineer. It is provided for the purpose of performing necessary drafting, designing, surveying, planning, and coordination in connection with the activities of the Aviation Engineer units under the Air Force Engineer. Normally provided on the basis of one per Air Force, although in large theaters additional units may be required.

No pains have been spared to make the equipment for aviation engineer units as complete and adequate as possible, without at the same time overburdening the troops. Thus, general-purpose construction equipment was preferred to more efficient, but specialized, machines. Even so, the separate aviation battalion has no less than 220 pieces of heavy equipment, and 146 vehicles. This heavy equipment includes such items as diesel tractors with bulldozers, carry-all scrapers, auto-graders, gasoline shovels, rollers of several types, mixers, air compressors, trenches, well drill, and the like, with numerous trucks and trailers. Moreover, sets of additional special equipment—additional asphalting and concreting equipment, rock crushers, draglines, pumps, and the like, are provided in storage for use if and when needed, as in case of overseas task forces.

THE USE OF AVIATION ENGINEERS

It should be borne in mind that aviation engineer units are not intended for peacetime construction, and have no role in the maintenance of airports in time of peace. This does not mean that, for training, these units can not and should not be used on definite construction tasks, but it is not intended that they supplant the existing agencies, either for construc-

MILITARY REVIEW

tion or maintenance in the zone of the interior. Even in a theater of operations, it is not contemplated that all airport construction shall be necessarily performed by aviation engineers. The latter are intended primarily for "pioneer" work on the more advanced airdromes, where speed is essential and the utilization of existing facilities or improvisation of new ones is indicated. The more permanent base airdromes in rear areas, built more deliberately and with greater refinement, are likely to be the work of engineer general service regiments. These latter units, given some special equipment and training, should be able to include airport construction among their many tasks.

No definite rule can be given as to the number of engineer troops that may be needed with an Air Force, though it is noteworthy that the British Expeditionary Force contained no less than 60,000 engineers, one-fifth its total strength. The large program of airfield construction in France was doubtless largely responsible for this high percentage.

In their important role of assistance in airdrome defense, aviation engineers at an air base naturally come under the command of the officer charged with the defense of the base, and operate similarly as in other defensive combat missions. Engineer troops stationed at an airdrome with the primary mission of maintaining the field in flying condition will have ample opportunity to strengthen the defensive works—pill boxes, emplacements, road blocks, mine fields, and the like.

TRAINING FOR THE TASK

Basic training of recruits is given in the unit as they are received direct from the reception center and is in general the same well-rounded training that all engineer soldiers receive.

Troop units are not, in general, employed in the air base construction program being executed by District Engineers. But in many cases they have undertaken some definite tasks in this program, such as the construction of soil cement and asphalt parking aprons and roads. During the past few months they have performed emergency construction work in connection with the dispersal and protection of airplanes, by means of taxi-tracks, hard-standings, and revetment pens. They have assisted in the development of steel landing mats, and of the best technique for airdrome camouflage. They have constructed experimental runways using various types of construction.

In training for airdrome construction, the objective of speed is constantly sought for. A recent article in *Parade* describes the construction of an airport in China, with runway designed to take the "Flying Fortresses." A hundred thousand Chinese, with hand tools, completed this task in twelve weeks. A battalion of aviation engineers, with modern equipment, would undertake to cut this time in half.

One tested device that makes for speed is the transportable steel landing mat. Several types of prefabricated sectional runways have been tested and found more or less satisfactory to serve in lieu of paved runways. The mats which have been found most suitable are neither light nor inexpensive; the materials for a single runway weigh some 1,000 tons, more or less. However, the preparation of a runway, under suitable conditions, can thus be reduced from weeks to a matter of days.

There is a definite need for two types of landing mat. The emergency or light type is definitely a field expedient. It is designed to provide more or less temporary runways for pursuit and observation planes at advanced airdromes: it can be used for taxi-tracks and hard standing at any airdrome.

The Somerfeld track is a British development of this type, and has considerable use in England. Essentially it consists of chicken wire reinforced by steel rods. Its weight is only about one pound per square foot; it is fabricated in rolls ten feet long. Our own preferred type is the light rod-and-bar. This is made in panels, three feet by twelve feet, of welded steel members, the panels being readily fastened together. It weighs more nearly two pounds per square foot. Another type, less rigid and not as promising, is of basket-weave steel.

The transportable or heavy type landing mat is more than an emergency landing surface. Rather it provides a rapidly laid semi-permanent runway which, if laid on a reasonably stable foundation, can be considered the equivalent of the normal hard-surfaced runway for all types of planes.

Several types have been tested, principally the Irving grid plank type, and heavy rod-and-bar—all of which are more or less satisfactory. These mats weigh from four to five pounds per square foot. The Irving grid type met successfully a series of thorough tests in the Virgin Islands but is limited in production. The plank type, used more successfully in several theaters, has more bearing power than the grid or the rod-and-bar but does not lend itself as well to camouflage.

The Engineer Board deserves credit for its thorough work in the development of all these types, and detailed information and opportunity to examine the various mats are available at Fort Belvoir.

Camouflage has been stressed as an integral part of all Aviation Engineer training. Camouflage technique and its application to field airdromes has been developed by Aviation Engineer units working in coordination with the Engineer Board.

During the Carolina maneuvers in the fall of 1941 the 2d Battalion of the 21st Aviation Engineers constructed the first field airdrome in the continental United States with a runway of transportable steel plank. This mat was laid in nine days, including grading, and was used by many types of planes including heavy bombers.

ENGINEERS WITH THE ARMY AIR FORCES

The camouflage of Laurens Airport by Company B, 21st Engineers, during the Carolina Maneuvers of 1941, was the first outstanding example in this country of a completely camouflaged field airdrome. The contour ditching of the surrounding terrain was used as a motif and was successfully simulated on a turf field. Ditches and orchards were created by ground painting with cut back asphalt. Dummy roads were produced by strips of light colored clay framed by ditches of asphalt.

AVIATION ENGINEERS IN WAR

Although still a young component of the Army Air Forces, Aviation Engineers have established themselves in the theaters of operation and already have a proud record for themselves. A year ago there were only a handful of Aviation Engineer units. Camouflage Battalions and Air Borne Battalions are now in existence.

Aviation Engineers have built or are building airfields in Alaska, in Africa, Canada, Australia, India, Hawaii, Panama, Puerto Rico, Greenland, the South Seas, and Great Britain. They have built airfields under the most diverse conditions in almost all the far-flung theaters of this war.

They built the fields on Bataan, and, further south in the Philippines, the fields that enabled General Royce's bombers to operate until the end of that campaign. The work has been carried on in Australia and New Guinea.

In New Caledonia Aviation Engineers built airfields and then brought aviation gasoline for the planes ashore in rafts from a freighter lying in an uncharted roadstead. They had one airfield built and gasoline ready in time to enable our Army and Navy planes operating from there to play a decisive role in the battle of the Coral Sea.

In Hawaii the Aviation Engineers were very much on the job on December 7, and shortly afterwards opened a number of fields. These have included rapidly laid steel runways.

An airfield built by Aviation Engineers allowed fighter planes and bombers to give close protection to Dutch Harbor and upset the Japanese plans for their attack on that base.

Landing on these islands as part of a task force and starting from scratch, an Aviation Engineer bat-

talion had a runway ready for fighter-plane operation in five days. In another week bombers were operating from the same base!

In one theater an Aviation Engineer officer is building fields with native labor, including several thousand women who are breaking rock by hand.

Aviation Engineers are building a chain of bases for our Army Air Forces in Great Britain. It is a gigantic undertaking and work is progressing twenty-four hours a day. One battalion is reported by the "Stars and Stripes" to have cut the completion date on their airfield by one-third.

Camouflage activities of Aviation Engineers have not been confined to the fields they build. Every two weeks the Air Force Camouflage School at Hamilton Field, staffed by Aviation Engineers, turns out fifty officers from all elements of the Army Air Forces who have acquired a practical knowledge of camouflage. Aviation Engineers have been assisting Air Service Groups in operating in the field from concealed bivouac.

In several Air Forces, mobile instruction units under the Air Force Engineer are operating from field to field conducting camouflage schools for the noncommissioned officers of the Army Air Forces. The Fighter Command School at Orlando has an Engineer Company to assist in camouflage activities. Aviation Engineers in two Air Forces are constructing large dummy airfields. Schools in camouflage are being conducted in Air Forces overseas.

CONCLUSION

Aviation Engineers no longer constitute a new type unit. Their numbers are growing steadily, constituting at present some 50,000 officers and men. Events have proved the soundness of this provision for assisting the Army Air Forces in their great task. The actual construction work accomplished in overseas theaters is already impressive, and it is significant that more than two-thirds of the units at present constituted are at work in overseas departments of theaters of operation. Aviation Engineers are proud of General Arnold's recognition of them as an integral part of the Army Air Forces, and are ready to provide those essential field airfields without which the most powerful air fleet cannot operate.

Nothing so annoys soldiers as a badly given order, badly understood,
and which makes them walk more than they should.

—Captain Elzéar Blaze in *Recollections of an Officer of Napoleon's Army.*

"Of What Use Is That Box?"

MAJOR H. C. DOZIER, JR., *Coast Artillery Corps*
Instructor, Command and General Staff School

IN PASSING in front of our barracks, the King of Prussia stopped to talk with us; the letter-box of the regiment, which on campaign is placed near the flag, astonished him greatly.

"Of what use is that box?" asked Frederick William.

"Sire, to receive the letters which each one of us writes to France."

"During a campaign, is your mail so organized that it can take care of the letters of all the soldiers?"

"Yes, sire, it leaves every day, every day it arrives, and we receive the Paris papers in two weeks."

"It is admirable!" replied the King."¹

Admirable indeed in Napoleon's time, and admirable today.

This same sentiment has been expressed many times by military men. The current expressions, however, are more informal and more concerned with the individual soldier. Today we hear such expressions as, "Next to good food, the most important thing to a soldier is mail from home" and, "If they can have good food, American cigarettes, and some word from the folks back home, they ask for nothing more." Not only are these things important to the individual soldier, but they are also an important part of that vital factor of military success—troop morale. Napoleon realized this just as our military leaders realize it today.

Mail service to the Army of the United States is a service to a "citizen" army. Bill Jones, the kid who worked in the corner drug store, is now Staff Sergeant William H. Jones, AAF, somewhere in India. Tom Smith, the boy next door, is Corporal Thomas R. Smith, 3d Infantry Division, somewhere in North Africa or Italy. Lawyers, clerks, stock brokers, caddys, rich and poor alike, are all vitally interested in maintaining that intimate bond with family and friends back home. Their letters maintain this bond—not important letters as letters go, but news that will appease an insatiable hunger that nothing else will satisfy.

Such is the job of the Army Postal Service.

The efficient handling of this job is no small task. Mail must be delivered to all the far corners of the world as a matter of course. This is not a one-front war as was World War I, but valuable experience gained in operating the Postal Express Service, which was placed in operation in July 1918, is being wisely used today.

¹*Recollections of An Officer of Napoleon's Army* by Captain Elzéar Blaze.

The present Army Postal Service was organized with complete cooperation between the War Department and the Post Office Department, the duties and responsibilities of each being defined in an agreement entered into 19 March 1940. The Post Office Department is responsible for handling mail in the Zone of the Interior with the assistance of the army, while the army establishes and maintains the service overseas.

While the mission of the Army Postal Service is to assure adequate postal service for the army, the responsibility for its operation is a function of command. Commanders of all echelons are responsible for prompt and efficient service within their particular jurisdiction. For this reason it is important that commanders and staff officers be familiar with the organization of the service and some of its problems.

It has been said that the only constant factor in the handling of mail for the army is the percentage of incorrectly and inadequately addressed mail. Of the twenty million pieces of mail handled each week for troops overseas, about thirteen percent—or nearly one letter out of every seven—is misaddressed.

The address of a soldier overseas includes the following elements:

- (1) His full name, rank, and army serial number.
- (2) His company and regiment.
- (3) His army post office number.
- (4) His address in care of the proper postmaster.
- (5) The sender's return address.

As an example (names, organizations, and APO are fictitious):

- (5) James Smith
1257 E 57th St
Kansas City, Mo.
- (1) Cpl John D. Roe, 20,246,837
- (2) Company A, 26th Infantry,
- (3) APO #4
- (4) C/O Postmaster,
New York, N. Y.

When any one of these elements is missing from the address, avoidable delays result and the principle of prompt delivery is defeated. All ranks must be properly instructed in the correct manner of addressing mail and impressed with the importance of communicating this information to their correspondents.

"OF WHAT USE IS THAT BOX?"

Now that we have a properly addressed letter, we can follow it in an assumed situation to see the function and responsibility of the different parts of the service.

First, our letter goes to the local post office in Kansas City, which forwards it through normal

tion is used—air and surface. Some of the mail goes by air and some in convoy; the most expeditious means available are used.

Upon arrival overseas the mail is received at the base post office at Casablanca and the mail bags are sorted for delivery to the Army Post Offices (APO's);

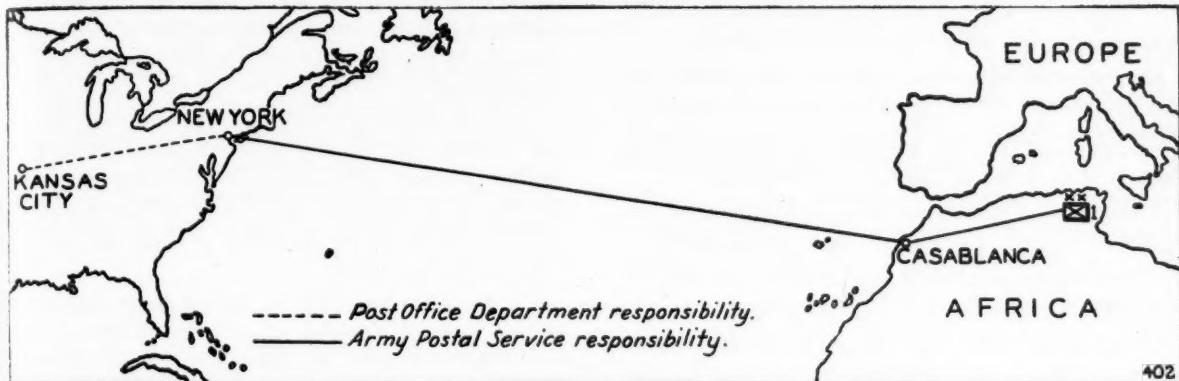


FIGURE 1.

postal channels to New York, the location of the port of embarkation through which the letter will be sent overseas (Figure 1).

In New York the letter is sent to a postal concentration center, an installation of the Post Office Department at which all mail for the particular theater of operations is brought together for sorting. After sorting is completed, mail is then turned over to the New York Port of Embarkation Post Office, an installation of the Army Postal Service, at which time the responsibility of the army begins. Here mail is prepared for shipment overseas and tagged with code labels showing the destination of each sack of mail.

The next step is to transport the letter overseas. This presents the greatest single problem. The Army Postal Service controls no transportation and must depend upon that available from time to time to assure delivery of mail. All available transporta-

addresses are rechecked because men or units may have been moved.

The mail is then sent forward from the base post office to the regulating station serving that part of the theater in which the 26th Infantry is located.

A postal regulating section is maintained as a part of each regulating station. This section is charged with properly routing mail to the railhead serving the 1st Division.

The mail then goes forward on the unit section of the daily train and arrives at the railhead where it comes under control of the 1st Division (Figure 2). Delivery from this point forward is now the command responsibility of the Commanding General of the 1st Division. To exercise this responsibility certain means are organic to the division.

The division means are:

1. The division G-1 is charged with general staff

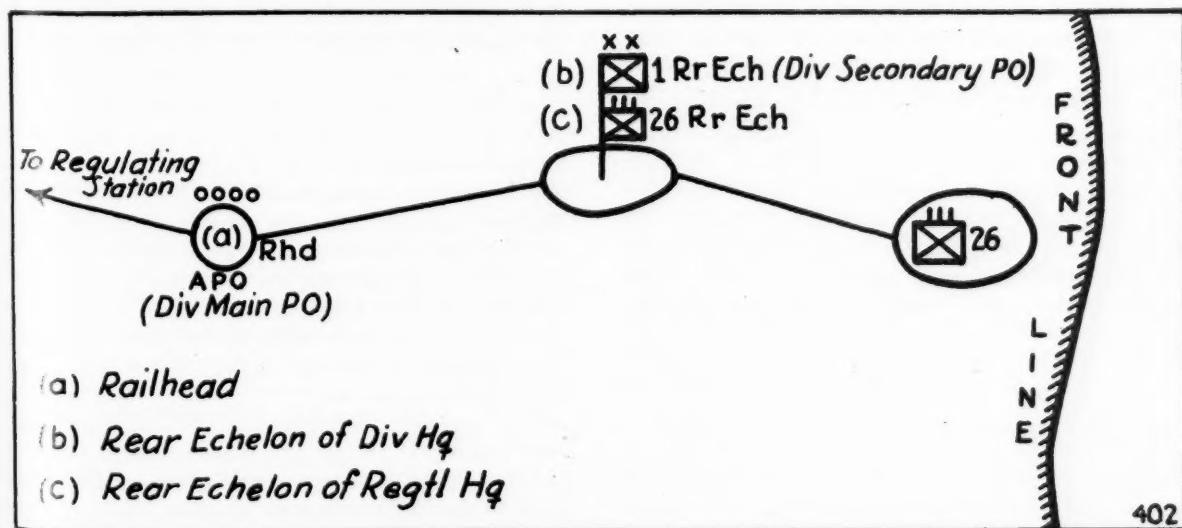


FIGURE 2.

MILITARY REVIEW

responsibility and must provide the postal plan for the division and supervise its operation.

2. The Adjutant General is charged with operating the postal service in accordance with the approved plan of the division.

3. The postal officer and postal personnel, a part of the Adjutant General's section, are charged with direct operation of the division postal service.

4. Regimental, battalion, and unit mail clerks are charged with the service in their respective units.

The postal officer will establish two post offices to handle mail after it reaches the railhead:

1. The division main post office or Division Army Post Office is established at or near the railhead.

2. The division secondary post office is established at the rear echelon of division headquarters.

The secondary post office will serve the rear echelon and any other unit that may be near by, but its most important function is the furnishing of a directory service for the division.

When the mail arrives at the railhead, it is taken to the Division APO and prepared for delivery to the regimental and battalion mail clerks.

There are many ways that delivery to units can be made, but one of the best and most economical is to hold the mail until transportation from the units arrives at the railhead to draw rations. The mail clerks can accompany this transportation, pick up the mail, carry it forward to the regimental area, and distribute it there to the company and battery mail clerks. The mail will then follow the channels of distribution of rations until it reaches the individual soldier.

The company or battery mail clerk is the connecting link and point of personal contact between the individual soldier and the postal service. From the division point of view he is the most important element of the whole system. It is through his intelligence and attention to duty that mail is delivered promptly to the individual present for duty and the individual who may have been removed from his organization through hospitalization or transfer.

The unit mail clerk maintains a current roster for his company and includes the names of all men who have formerly been members, with their forwarding address. When a letter arrives for an absent man it is a simple matter for the unit mail clerk to refer to his roster, readress the letter, and remail it with outgoing mail. If, however, a letter

is missent to a company, the company mail clerk returns it to the regimental rear echelon where the regimental directory service is maintained. If the forwarding address is available here, the letter is readressed and remailed. If this is impossible, the letter is returned to the division secondary post office for directory service. Thus, we see that each echelon of the division postal service provides a directory service for incorrectly and inadequately addressed mail.

Mail for which a proper forwarding address cannot be furnished by the division is returned to the theater central directory service which is usually located near the base post office. This installation provides a complete directory service for all individuals in the theater.

In the division efficient operation of the postal service can be assured only through close general staff supervision by the division G-1. G-1 must visit the different echelons of the service to see that each is operating properly and according to plan.

In addition to handling ordinary letters, packages, and periodicals, the APS has inaugurated additional services which give a complete postal service to soldiers overseas. These services include V-Mail; expeditionary force message, a fixed-text cable message; a sender's composition cable message; and money-order service.

The most popular of these services is V-Mail. This is a microfilm service which speeds delivery and provides a great saving in shipping space. During the first year of this service, over 100 million V-Mail letters were handled. Most of these letters were microfilmed and delivered overseas in their reproduced form. The saving in shipping space through the use of this service is so great that all of these letters could have been carried—in microfilm form—in a single transport plane with room to spare. The same number of ordinary letters would have taken more than 1,000 tons of shipping space. Increased use of V-Mail will do much to solve the transportation problem of the Army Postal Service.

This brief description of the APS and some of its problems should provide a partial answer to our question: "Of what use is that box?" It places in the hands of the commander overseas an important means for increasing battle efficiency through increased troop morale. To achieve this it is necessary for G-1 to exercise continuous general staff supervision to insure that the mail keeps moving and is never allowed to jam up in storage.

Activities of the Provost Marshal General Training Center

[Prepared for the Military Review by the Public Relations Office, Provost Marshal General Training Center, Fort Custer, Michigan.]

FOR THE tremendous job of policing the greatest Army in America's history, for controlling enemy aliens in this country, and for processing prisoners of war and policing occupied territory, the Provost Marshal General has converted Fort Custer, Michigan, into a training center where thousands of officers and enlisted men become highly skilled in the many varied and complicated duties for which they are headed.

Included in the curricula of the schools are refresher, advanced tactical, and investigator courses for officers; and officer candidate, investigator, air force basic military police, and occupational military police courses for enlisted men. The Unit Training Center produces Zone of Interior military police battalions, Prisoner of War Processing companies, and Escort Guard companies. On the post also is the Military Police Board, charged by the Provost Marshal General with originating and submitting, with recommendations, reports on matters tending toward the improvement of the Corps of Military Police.

To conserve manpower and to insure that the best teaching talent is available to all students, an intricate but flexible system has been worked out by the Department of Operations whereby students of all classes move through nine departments of instruction. Enrollment of students in the schools is through quotas assigned to all Service Commands and units of the Army Ground Forces and Army Air Forces.

The several schools are set up as administrative units, each with its director, and grouped as School for Officers, School for Enlisted Men, and Officer-Candidate School. Following is a short summary of their purposes.

School for Officers.—This includes the Refresher course, the Advanced Tactical course, the Occupational Military Police course, and the Investigator course. The Refresher course, of eight weeks duration, is designed to supplement earlier military training with the techniques of the Corps of Military Police. The Advanced course, covering a period of eight weeks, is designed to amplify the education of officers already trained in various phases of Military Police work. The Occupational Military Police course, of eight weeks duration, is for officers who will eventually lead Military Police units in occupied territory. The study of problems inherent in such service constitutes the substance of instruction. In

the eight-weeks Investigator course emphasis is placed on modern means of investigation, including use of scientific equipment, with special treatment of its application to military service.

School for Enlisted Men.—This includes the Investigator course, the Occupational Military Police course, and the Air Force Basic Military Police course. The first of these, of eight weeks duration, is designed to supply the demand for trained criminal investigators. The Occupational Military Police course, lasting four weeks, is for men who, after completion of basic training, have been selected for training in the organization and operation of military government in occupied countries. The Air Force Basic Military Police course, lasting eight weeks, provides students, who have been selected after at least four weeks of basic training, with knowledge which will enable them to perform military police duties in air force units.

Officer Candidate School. — This twelve-week course is given to selected enlisted men and covers all fields of duty that a military police officer may be called upon to perform. Men who complete the course successfully are temporarily commissioned as second lieutenants in the Army of the United States.

The nine departments of instruction, each supervised by a department chief and assigned a group of subjects related either by character or purpose, are as follows:

Department of Basic Instruction.—This department grounds all students throughout in the basic duties of the soldier, while at the same time outlining methods which will assist the potential leaders in passing on their knowledge to future commands. Infantry drill is stressed for its disciplinary training and morale building. Map and aerial photograph reading are other major subjects, while sanitation and hygiene, military courtesy and discipline and customs of the service, defense against chemical warfare, marches and bivouacs, identification of aircraft and armored vehicles, morale and special services, are also covered. Presentation of the material and the number of hours devoted to each subject is in ratio to the training status of students and their prospective duties after graduation.

Weapons Department.—Instruction in this department is concerned more with the practical than the theoretical aspects of weapons used by military police units. For this reason a minimum of time is spent on lectures and a maximum on demonstration and

MILITARY REVIEW

practice. The department is organized into four instructional teams: Group A—M-1 rifle; Group B—Thompson sub-machine gun, pistol, and shot-gun; Group C—light, heavy, and caliber .50 machine guns; Group D—60-mm mortar, bayonet, grenades, moving ground and air target marksmanship, and the technique of rifle fire.

Department of Tactics.—The primary mission of the tactics department is instruction in defensive and offensive tactics employed by small units. Organization and employment of tactical units up to the battalion are stressed, with considerable time being spent on the individual's part in the operations. Students are taught the methods and values of hasty field fortifications, cover and concealment, employment of small arms, camouflage, scouting and patrolling, night operations, combat and counter intelligence, communications, and the importance of team work. Extensive study is given to the estimate of the situation, combat orders, movement of units under varied conditions, and defense against both mechanized and air attack. Advanced students are given, in addition, instruction in staff duties and practical exercises in staff procedures and functions.

Department of Police Instruction.—This department concerns itself with instruction in the fundamentals of military police work, that is, in laying the base upon which the military policeman's education is built. Organization from the company to the Provost Marshal General's office is thoroughly covered. Features of the broad program of instruction are the techniques of town patrol, circulation control in the field, and prisoner of war administration. Considerable attention is given to riot control and to relations between military police and civil authorities.

Department of Occupational Military Police.—Created, as its name indicates, to prepare officers and enlisted men for duty in occupied territories, this department teaches the principles of military government as applied by our own and other countries, together with the history and political structures of territories which may be brought under American military administration. Students get both background and practical work in liaison and coordination with all units of the command, and a study of foreign police organizations is included.

Department of Traffic.—Because mobility is the keynote of modern military success, military police officers and enlisted men are thoroughly trained in military and civilian traffic control. The course given by this department covers traffic control in the Zone of Interior. Traffic control in combat zones extends from the broad planning phases of movements of large units to intersection control by the MP private. Effective convoy operation and the economical utilization of available road nets are stressed. As in other courses, students are taught the best methods of passing on their knowledge to their commands.

Department of Criminal Investigation.—Recognizing that the value of an investigator is measured by his experience, the department of criminal investigation confines itself to a balanced training program covering the fundamental principles of investigative work. It does manage, however, to give students considerable practical training, and the department is staffed with experienced investigators and technical specialists. A few of the major subjects are report writing, observation and description, surveillance, fingerprint identification, technique of raids, interrogation, and investigative photography. These, together with instruction in technical subjects, give the student a background of investigative work. Impressed on him are the cardinal principles of investigation—the collection of information and the preservation of evidence.

Department of Law and Administration.—This department, formerly the Law Department, has the dual task of instructing in law and administrative procedure. Every officer must have a basic knowledge of military law, both as to its disciplinary application and its relation to civil law, but the military police officer is required to have a more extensive grounding in the subject. He must be familiar with the legal latitude permitted him and the extent of his obligations in the exercise of his duties. In this course the question of jurisdiction is exhaustively explored. Powers of arrest, search and seizure, extent of military aid to civil authorities, and Federal court procedure—all subjects of importance in military police, are thoroughly covered. Other material is included which, while not so vital, may prove useful. In the Administration section the student is made familiar with all essential records kept in the company and with those maintained by the personnel adjutant. Practical exercises are used extensively to enable the student to obtain a first-hand knowledge of correct and accurate army paper work.

Department of Physical Training.—This department's major aim is to present each student with a working knowledge of self-defense and aggressive control in personal encounter known as "Jujitsu," or "Judo." Incorporated with the Judo course are first aid and body-building exercises, as well as methods of handling armed and unarmed prisoners. Many of the instructors are specialists in the practice of "Judo."

Two other departments, those of Operations and Publications, are essential cogs in the school's machinery. The Department of Operations is a sort of "switchboard" which synchronizes instruction schedules to gain maximum economy in the use of time and facilities. It provides a full timetable planned well in advance for every class, but the schedule is sufficiently flexible to meet emergencies and disruptions arising from inclement weather or other conditions beyond control. The Publications Department provides visual training aids, mimeographs, bulletins, and other instructional material, and re-

ACTIVITIES OF THE PROVOST MARSHAL GENERAL TRAINING CENTER

produces charts, drawings, maps, and overlays for the various courses. Each month it publishes the Provost Marshal General Training Center *Bulletin* for distribution to all activated units of the Corps of Military Police.

The Unit Training Center was established as an element of the Provost Marshal General Training Center on November 20, 1942, after it had become apparent that units trained along approved and standardized lines were needed. The Unit Training Center is charged with the activities and training of Zone of Interior Military Police battalions and companies, Prisoner of War Processing companies, and Escort Guard companies. Moulded into effective military teams, the units are assigned—ready for immediate duty—to service commands and tactical forces.

The Military Police Board, formed under A.R. 190-10 in January 1942 at Arlington, Virginia, has submitted detailed reports on many subjects to the

Provost Marshal General after consultation, investigation, research, testing, examination, and inspection. Already considered, or now under consideration, are such matters as organization and activation of various authorized military police units, uniforms, arms, equipment, transportation, and personnel peculiar to the C.M.P. It has concerned itself with extensive tests on radio communication for Tactical and Zone of Interior units, testing of sirens, research in emergency lighting, rifled shot guns, luminous road markers, chemicals and smoke, the revision of manuals, and the more recent and interesting subject of the training and use of dogs in military police work. It produces training films and consolidates suggestions from members of the faculty on improvement in methods of instruction and use of material at the school. In all reports and recommendations the board keeps the improvement of the Corps as its sole guiding principle, maintaining a collective open mind to ideas from all sources.

Orientation for Combat Efficiency

[From the Orientation Issue of the *Special Service Digest*, Special Service Division, Army Service Forces.]

MODERN mechanized warfare has made more complex the psychological factor which weighs so heavily in successful contact with the enemy.

Formerly, armies fought in comparatively close order, in which form it was easier to maintain in combat the steady factors of discipline, precision of action, and personal leadership. Now, however, we fight in small groups and often as individuals. Dispersion, cover and concealment, fox holes and slit trenches are even more the order of the day.

With the disintegration of the group morale factor, the importance of individual, self-sustained morale has become vital. It has a direct bearing on combat efficiency . . . on combat survival.

In simple terms this inner psychological strength springs from an *impelling belief in the mission* and a *sense of urgency about getting at the enemy*. If the soldier is not so armed psychologically, he may be

just as vulnerable in combat as if he were improperly trained or poorly equipped. If he is so armed, even if he is alone, pinned to the ground by a curtain of fire, he will not be demoralized by the inevitable question, "Why am I here?"

Such inner strength does not miraculously descend on the soldier when he reaches combat area. It must be the result of progressive orientation which starts at an induction center and continues ceaselessly through all phases of training.

The soldier must understand the reasons why he must fight, and the important role he personally is playing in a global war. He must understand the nature of the enemy, and the reasons why the enemy must be exterminated like a mad dog. He must have confidence in his leaders, in his weapons, and in his Allies who have made common cause with him.

Such is the object of orientation.

The Dive Bomber

LIEUTENANT COMMANDER WILLIAM O. BURCH, *United States Navy*

THE USES to which any weapon is put depend on many conditions. In order to narrow the field, this article will discuss the uses of a dive bomber as compared to a horizontal bomber. The types of targets against which it is believed that a dive bomber is best able to launch an attack will be considered.

This article is not intended to raise controversy among advocates of the two types of bombing planes. It is not meant to praise the merits of one type at the expense of the other. It is written merely as the opinion of one man regarding the one type of bombing that he has engaged in for some time: that is, dive bombing. Horizontal bombing is outside the field of the author, as may be noticed by some of the comments. It is mentioned only to serve as a basis for comparison and contrast in trying to bring out certain points.

A mobile target is more vulnerable to dive bombers than to horizontal bombers. The target is less able to maneuver out of the way of a bomb dropped in this manner; whereas, after a bomb is released by a horizontal bomber at a great height, the target has better chances of maneuvering out of the way.

On a fixed target covering a large area and well protected by antiaircraft guns, the horizontal bomber at a great height could be very accurate with pattern bombing and much less vulnerable to gunfire than the dive bomber. However, against a concentrated land target in the form, say, of a force of tanks, mobile, but unable to carry much antiaircraft protection with them, the dive bomber should be highly effective.

The advantages of the dive bomber lie in its versatility, mobility, and deception. The dive bomber's resort to glide bombing in the case of low ceiling or bad visibility is paralleled with skip bombing on the part of the horizontal bomber.

Constant maneuvering by the target will not affect the dive bombing approach adversely. In horizontal bombing, if the target does not continue maneuvering in the same direction and at a constant rate, the set-up for a correct approach is changing constantly. The locus of the release point for horizontal bombing drops is fixed above the target, and may not be advantageous as regards the element of surprise. The approach to this release point must be direct. In dive bombing, full use of the sun or cloud cover can be made and a more deceptive approach executed. Dive bombers executing a split attack can come in from all directions. Because of rapid change in altitude, there is a certain amount of

avoiding action inherent in the method of delivering a dive bombing attack. Also, a certain amount of avoiding action can be taken in the last part of the dive, since the length of time the bomber must be "steady on" is relatively short. A horizontal bomber must make a steady approach for an appreciable interval during which time he is subject to antiaircraft fire. Pull-out puts the retiring dive bomber at a disadvantage that is not faced by the horizontal bomber.

Regarding the accuracy of the two types, this, of course, depends upon the types of targets and the conditions under which the attacks are made. In dive bombing, each bomb is aimed individually, not in a salvo based on the decision of one lead bomber. Ballistic wind scarcely affects a bomb released at the usual low altitude in a dive. The pilot corrects for this wind all the way down by directing the plane through different winds at different levels in flying his plane to the release point. Thereafter, the only wind to consider is the wind at the level of release. A good bomber can sense this wind fairly accurately. In horizontal bombing it is something of an unknown quantity to reckon with, unless operations are conducted in an area where upper air soundings have been taken by one's own forces. The same angular error present at the low altitude from which a bomb is released in a dive amounts to less linear error on the surface than does that resulting from a high release point, as in horizontal bombing.

Dive bombers, being relatively small, can be carried aboard ship in such large numbers that formidable attacks can be launched on targets which horizontal bombers might not be able to reach—practically or in force. This fact fits in nicely with the long range policy necessitated by the present war. The facts that dive bombers are more maneuverable, cost less, and require smaller maintenance crews are offset by the larger bomb carrying loads of horizontal bombers.

The dive bomber is unable to use the armor piercing bomb to best advantage. Since, as has been brought out previously, the dive bomber goes low in his dive to release his bomb, after release the bomb does not have time to attain its terminal velocity before striking the surface. It therefore does not have its penetrating power developed and will not pass through heavy armor. The horizontal bomber profits by his high altitude to have his bomb develop its full penetrating power.

Protection is an item which any pilot must consider regardless of what type the plane may be, and despite the fact that an offensive mission might be

THE DIVE BOMBER

the chief concern. It is here that the dive bomber needs more help, probably, than do the horizontal bombers. Fighter protection is a fine thing for any type plane; for the dive bomber it is a necessity. If attacked by enemy planes, the dive bomber is tempted to meet the attack with his own fixed guns. This would be his greatest mistake. He must stay closed up with other similar planes of his group in order to have all free guns concentrated for mutual protection in repelling the attack. He reduces his chances of escape if he tries to make a fighter out of his plane, which was not intended for that use. More important yet, he will not be using his fuel to progress towards the target. Dropping his bomb on the objective, especially if that objective is an aircraft carrier, is the best protection he can afford himself. It will quiet the antiaircraft of that ship; hence, it will increase the accuracy of following planes; and it will disconcert the enemy fighters as nothing else can in depriving them of a base to which to return. The guns of a dive bomber can best be used to keep enemy planes away, not to chase them and shoot them down. In any plane the primary weapon should be kept in mind constantly. In a dive bomber, that weapon is the bomb.

Each type of plane is an indispensable weapon. There are many combat missions on which either or both can be used effectively. There are some missions on which one type or the other definitely would be more suitable. It is the job of staffs and the higher commands intelligently to assign missions to planes of various types according to their special qualifications. It is the job of all pilots to get the most out of their planes regardless of the mission assigned.

Regarding the pilots of dive bombing planes, there is nothing easy, nor is there anything mystical, about their problem. Contrary to the idea embodied in some motion pictures or in fantastic tales in some magazines, the successful dive bomber pilot does not have to be a superman. He does have to be hale, hearty, and alert. The discomfort and the fatigue elements

imposed by the use of oxygen and high altitude flying are probably less rigorous than those experienced by the pilot of horizontal bombers. The strains imposed by pull-outs at the end of every dive are tiring, but this assumes more importance in training than it does in actual combat. In training, pilots may make many dives a day, and the effect is cumulative. On combat missions very few dives are made on each flight, and there is apt to be a considerable time between flights—at least, between the diving part of successive flights. Pictures of pilots blacking-out, becoming unconscious, and bleeding at the mouth as a result of dive bombing are highly exaggerated. After a few training flights, the pilot soon learns so to adjust his dive that he is seldom required to make snap pull-outs or other maneuvers which build up sufficient forces to cause him to go black. The average high force exerted in pull-outs is approximately six times the force of gravity, or 6 g. If this force is maintained for a very short time, the average pilot is not bothered by it. From 4 g. to 6 g. is an overall average. The amount of g. plus the length of time that the pilot is subjected to this force determines to what extent it affects him. If the pilot gets on the target properly at a fairly high altitude, and releases his bomb then, he will have plenty of time in which to maintain a low rate of pull-out, thereby obviating any necessity to go black. It is when he comes down very steeply and releases low that a pilot has to haul back on the stick with all he's got. Also, it is not necessary to push straight over at, say, 20,000 feet, and come screaming straight down all the way. The plane has to be at the required steep altitude only at the altitude of release—so you see the pilot can approach his release point with moderation, and steepen his dive gradually. This, of course, depends upon what conditions are encountered over the target—such as clouds, sun, enemy fighters, and antiaircraft fire.

NOTE: The opinions contained in this article are those of the author and are not to be construed as official or representing the opinion of the naval service at large.—THE AUTHOR.

Whether we like it or not, combat means confusion, intermingled units, loss of direction, late orders, misleading information, unforeseen contingencies of all sorts. Troops must carry out their orders under conditions of fatigue, hunger, unfavorable weather conditions, and the devastating psychological and physical effect of the fire of modern weapons. Not to take into account these grim realities in formulating a plan of action is fatal. To attempt elaborate and complicated maneuvers, requiring perfect coordination between many leaders and many units, is to invite disintegration and defeat.

—*Infantry in Battle*

Planned Orientation Builds Mental Fitness for Combat

[From the Orientation Issue of the *Special Service Digest*, published by the Special Service Division, Army Service Forces.]

ORIENTATION is nothing more or less than the dissemination of facts to troops in such a manner as to build what we may term "mental fitness for combat."

The Axis nations have to *propagandize* their troops. We do not. Facts alone, *effectively presented* so that their significance can be understood, are sufficient to achieve among American soldiers that mental fitness which reflects itself in eagerness for training, desire to achieve efficiency at arms, determination to use that efficiency in the destruction of a personal enemy.

Orientation, then, is simply the vehicle through which fact and information should reach a democratic army. There are two parts to the job of orientation. There is the production of materials and their distribution to command. And there is the use of these materials by command in building an orientation program that will effectively get orientation facts across to the troops.

Both parts of this job were provided for by directive* which established an "Army Orientation Course." The materials are important, but materials alone do not produce an Orientation Course, which is the *setting aside of adequate time on a consistent basis, and the use of that time to build mental fitness for combat*. The materials—films, newsmaps, daily war news summaries, booklets, etc.—are merely the tools which aid the orientation officer in the accomplishment of that mission.

ORIENTATION OBJECTIVES

In the use of a specific allotment of time, the orientation officer must keep constantly in mind the fundamental objectives of orientation. He must have a "training standard," just as he has a training standard for technical efficiency and physical fitness.

Just what are these "training standards" on the mental or psychological side? There are five such standards, and they have been reached only when soldiers—

1. *Know why we fight.* Understanding of the causes and events that led to America's participation in the war makes clear to the soldier why he is in uniform.

2. *Know the enemy.* When the true nature of the enemy and his objectives is known, the soldier's determination to destroy him will be relentless.

3. *Know our Allies.* When the soldier has the facts about our Allies, he will know that he is a member of the most powerful, the most democratic alliance in history.

4. *Know and have pride in outfit.* When he knows the facts about his outfit, and its relationship to the organization of the Army as a whole, the soldier will understand the importance of his personal role in combat.

5. *Know the news and its significance.* Interest in world events and intelligent discussion of them will produce a *thinking soldier*, thus a *better soldier*.

In the soldier's progress toward these "training standards," his military training and discipline will become more efficient. He will approach the crusader's aggressiveness.

MORALE IS A COMMAND RESPONSIBILITY

Morale is a command responsibility at every echelon level. A properly executed Orientation Course can contribute greatly to the building and maintenance of morale among troops. Without orientation, troops are vulnerable to weakening of morale from many directions. "Why should we fight overseas?" "Germans are a peace-loving people; Hitler led them astray." "We're losing too many bombers on our raids." "Why do I have to be in the infantry; I'd like to be in the Air Corps." "When Germany is licked, the British and Russians will not help us defeat Japan."

Informed soldiers do not believe these things. If they have the facts, they understand. If they understand, they cannot be swerved from their mission, which step by step leads them through training to combat.

The Orientation Course provides the opportunity for such understanding; but before such a program can be assured of success, three requirements must be met:

1. Allocation of adequate time, regularly available.

2. Assignment of adequate, capable personnel to the preparation and execution of the program.

3. Close supervision and inspection.

In the decision as to the amount of time which can be allotted, consideration should be given to the effect of orientation in reducing training time by increasing the effectiveness of instruction. But to do so, orientation must be progressive and it must be consistent. And in the handling of orientation close

*Memorandum No. W350-28-43. The Adjutant General's Office, 9 February 1943.

PLANNED ORIENTATION BUILDS MENTAL FITNESS FOR COMBAT

supervision and inspection will provide an incentive and assure high standards of achievement.

There can be no hard and fast rule as to the details of the program. It must be tailor-made by each organization, to fit the varying requirements of size, organizational structure, tactical objectives, and age or educational level of the personnel.

But with the knowledge of the various phases of orientation, and an understanding of the tools and materials available, intelligent and resourceful planning will result in an orientation program which will meet specific needs.

KNOW WHY WE FIGHT

This is the fundamental phase of orientation. America has never participated in a war where the causes and events leading to war were more complex, less direct. The gigantic proportions, the audacity of the global conspiracy in itself challenged the ability of many of our leading statesmen to believe it. It still challenges the ability of many of our soldiers to understand this conspiracy, and how it threatens our very survival.

American soldiers must be brought to an understanding of the fact that the systematic conquest of the world has been planned for many years, in closest detail, by the Militarists of Germany and Japan.

That in deliberate quest for power, the enemy nations have methodically shaped the events leading to war.

That the people of the enemy countries have been regimented, their thoughts beaten into line, their liberties suppressed, and finally, weapons placed in their hands.

That America has always been a target for enemy ambitions because the Nazis and Japanese leaders see in us the industrial and natural resources imperative for their full world ownership.

That the enemy sees in our democracy an ever-present threat to their own ambitions, because they recognize, perhaps even more than we, that the world cannot exist half-slave and half-free and therefore stand determined to make it all slave.

That before the enemy could attack us he had to attack his neighbors, and that this was undertaken with such success in 1940 and 1941 that an onslaught against the United States itself followed logically.

If the soldier knows these things, he will realize the necessity of his being in the armed forces to insure the preservation of his country, and interpret training, discipline, and eventually combat in these terms.

KNOW THE ENEMY

It is only by understanding the nature of the enemy, the brutal methods by which he is attempting his gigantic plan of conquest, his wilful barbarisms, and the terrorisms he has practiced on others and will practice on our own people if vic-

torious, that training can be progressively narrowed down to the desire to get at and destroy the enemy.

The American soldier must understand that the enemy considers lies, treachery, and outrages all commendable tools for the accomplishment of any purpose.

That the enemy teaches his people that pity, respect for the weak, for Christian ethics, are shameful emotions.

That the enemy tells his people that they're an exalted race with a divine mission to rule the world.

That the enemy establishes a reign of fear everywhere, extending it in conquered countries to a reign of terror, believing this is essential for the maintenance of absolute rule.

That the enemy has a monstrous plan, of which all men, women, and children in America are to be victims; and that this means a nightmare for every human being on this earth who has known what it is to move and think and live as a free individual.

These are only a few of the things that the American soldier must know. When he does, there will be no question about his desire to fight.

KNOW OUR ALLIES

As the war turns more surely against the enemy nations, there will be increasingly aggressive and subtle attempts to create dissension and distrust among ourselves and our Allies. This can be best counteracted by anticipating and forestalling such attempts.

The American soldier must understand that it is impossible for us to win this war alone.

That we, and our allied nations, have been attacked by a common enemy.

That every one of the United Nations is struggling for fundamental existence, fighting to prevent itself and the world from becoming the slave property of the enemy.

That to win this struggle, all of us are forced to pool our strength, manpower, resources, and strategy in whatever ways will most quickly and thoroughly crush the enemy.

That any single member of a team such as the United Nations owes respect to the others—respect for their fighting prowess and the courage of their home fronts—and that people who lived through the blitz of Britain, who turned back the Nazis at Leningrad, Moscow, and Stalingrad, who held the Japanese in check for nearly a decade, are entitled to our admiration.

KNOW AND HAVE PRIDE IN OUTFIT

Pride of outfit . . . *esprit de corps* . . . is the yeast for many morale ingredients. It can be planned at every echelon level. Pride of the individual as a soldier, pride of platoon, of company, of regiment and division, pride of branch of service, pride in the Army, and above all, pride of country.

MILITARY REVIEW

To achieve this, the soldier must understand that great armies have always been built on the pride the individual takes in himself as a soldier.

That his unit has or can build traditions which, as he adds personally to them, will be a permanent source of pride to him in the world after the war.

That his branch of the service, whether it be Infantry, M.P., Medics, or Air Corps, is indispensable to victory, and that his is just as glorious a job whether he is running interference or carrying the ball.

That his country symbolizes in the freedoms for which it fights the only hope for millions of enslaved peoples who have tested the bitter fruits of the treacherous impact of our enemies.

KNOW THE NEWS AND ITS SIGNIFICANCE

Research has revealed among soldiers a widespread ignorance of national and international affairs. Yet there is significant importance in their being thoroughly and progressively informed on such subjects.

The American soldier has taken on the profession of arms, for the defense of his country. To the majority of them this is a new profession. The extent to which the soldier is interested in and relates that

profession to his ideals as a citizen, the better soldier he will be.

The American soldier must know that he has a personal stake in the progress of our arms on every combat front.

That the successes, reverses, and problems of our Allies have a personal relationship to his own mission.

That as a soldier his understanding of the inter-relationship of international events will have a direct bearing on his ability to contribute in a constructive way to the kind of a world he will want after victory has been won.

And that such a world will not be possible without the complete destruction of the enemy on every front, not just one.

Although the background of the war lays the foundation for such an understanding, its value will be lost if there is not ceaseless building on this foundation through frequent discussion of "what goes on in the world"—and particularly the progress of the war.

All of this leads to a *soldier who thinks*—and that is the weapon which our enemies can never match.

This, then, is the platform for effective orientation work, for the "Orientation Course."

We frequently hear this remark: "They will learn to take cover when the first bullet comes," or, "Don't worry, those men won't do it like that when they are actually in combat."

Men who learn from the first bullet will only learn by fear and that is the wrong way. They will scuttle to earth and figuratively put their heads in the sand like ostriches. Some will be wounded or killed by the bullet that is supposed to teach them. Fear leads to panic. Confidence, which is so essential to success, is never found where fear is.

Men must learn now to take cover. It cannot be too strongly emphasized that merely hiding is not the objective. The purpose of training in concealment is to teach men and officers to conceal themselves and still keep the enemy in view. It takes training to lie quietly watching an enemy, calm in the assurance that he cannot see you. It requires training to know the effect of backgrounds and it takes practice to learn how to use them.

—Colonel W. H. Wilbur in the *Infantry Journal*

Airborne Field Artillery

LIEUTENANT COLONEL JOHN W. MORGAN, *Field Artillery*
Instructor, Command and General Staff School

EARLY in the morning of 20 March 1931 a heterogeneous group of army transport planes from France Field, Canal Zone, landed at a ranch 76 miles away and disgorged Battery B, 2d Field Artillery (75-mm howitzers, pack) which then proceeded to go into position and fire a few rounds of blanks to celebrate the advent of a new means of transportation for field artillery. Today this would be referred to as a feat of "Air Transported Field Artillery," as the title "Airborne" is reserved for elements that can land without the use of an air-drome or landing field, but can land on stretches of flat ground or road useless for powered aircraft.

Today the United States Army includes several airborne divisions in various stages of development and a number of parachute units in addition. The division is organized along the same general lines as an infantry division, and contains both glider and parachute units.

For operations it will be organized into two or more tactical groupings known as "air teams." An air team may consist only of parachute elements, only of glider elements, or contain both types of airborne troops. The organization will be set up to fit a specific tactical situation.

Divisions have a more or less normal armament of light and heavy machine guns, 31-mm AT guns, and infantry mortars, and the artillery is armed with 75-mm howitzers, pack, modified for high-speed towing.

Transportation that will accompany the division by air is limited to a few 1/4-ton trucks and trailers. Airborne divisions are consequently capable of independent action, but on account of the difficulties of supply and the lack of heavy equipment of all kinds, are not capable of prolonged effort and must be supported by other forces within a few days. Such support may be by ground forces traveling overland, by ground forces transported by sea, or by air transported troops if landing fields have been secured.

It appears probable that the initial employment of our airborne divisions will be in conjunction with landing operations on the continent of Europe or on surrounding islands of the Mediterranean.

Such operations might be based on England or North Africa. In either event we would be embarking on operations in an area highly organized for defense, well garrisoned, thickly populated, and possessed of an excellent road net. We can expect prompt and vigorous counteraction by German or Italian mobile forces, probably including armored units.

Transportation from the departure airdromes to the landing area will be subject to attack by hostile

fighter aircraft although the operation should not be attempted until a high degree of air superiority has been obtained. The mission may be to penetrate a strongly held beach defense by attacking it from the rear while amphibious forces make a frontal attack.

A lightly held beach defense, on the other hand, may be attacked only by an amphibious force while airborne units, landing in rear of it, block the movement of hostile reserves seeking to counterattack the sea-landing force or to reinforce the beach defense.

Geographically, another possibility is the employment of airborne units in the island by island reconquest of the East Indies. Here we would be operating under entirely different conditions. The area is too great in extent to be strongly organized or strongly garrisoned by the Japanese. The population would probably play a less important role and the lack of roads as well as the distances involved would delay the intervention of hostile reserves. In many instances there would be little danger of interference by fighter aviation. On the other hand, the problem of departure airdromes would be more difficult of solution, and suitable landing areas for glider elements are scarce.

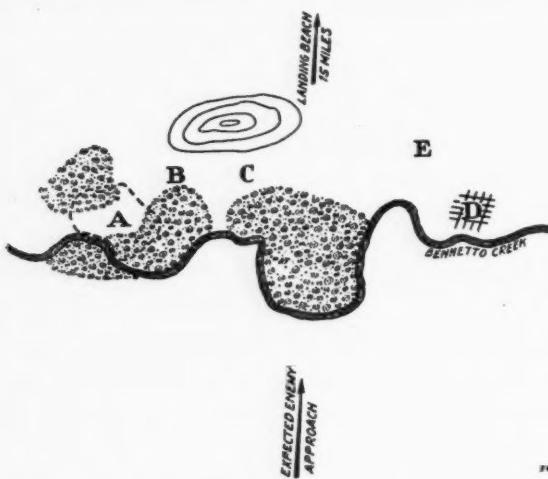
With this background it is possible to proceed to a consideration of the artillery in particular, and since the operations of airborne troops are characterized initially by extreme decentralization of control we will follow one howitzer section of parachute artillery through all the stages of an action.

The battery of which this section is a part has marched to the immediate vicinity of its departure airdrome after dark. For the journey the section is joined by members of the battery headquarters and organized into three groups, one for each plane of the flight that will carry the section. It has rehearsed this loading in its staging area five or six miles away. Loading is almost automatic when the time comes, and then the air force takes over. A long flight over the water, and the time to jump finally comes just as day is breaking. Out of the planes go the six pieces of the disassembled howitzer, each with its own parachute, and after them go bundles of ammunition and rations, the rocket launcher, other impedimenta, and the men. The sections of the battery have jumped immediately after the first elements of parachute infantry and in the same landing area. This area has been selected weeks before from air photos and it is almost a mile long and half a mile wide (see "A" on sketch).

As much space as this is needed to accommodate

the units of a parachute infantry battalion, the parachute battery, and the glider units that are to follow them. Although largely wooded, this area contains enough open ground for the gliders and the parachute field artillery. Woods are no obstacle to the landing of parachute infantry.

Supporting combat aviation has bombed and machinegunned hostile troops in the vicinity of the landing area for half an hour, which prevents their interfering with the landing. As soon as the chief of section has disengaged himself from his parachute he looks around and orients himself. Although the sergeant has not landed exactly where the plans called for, he has studied air photos of the area sufficiently in the preceding weeks to locate himself with a fair degree of accuracy. He sees most of the members of



his section close at hand and with them he moves the bundles containing the trail, axle, and wheels of his howitzer to a clump of trees which are the nearest cover. He posts the rocket-launcher team nearby to cover the most favorable avenue of mechanized approach and sends one cannoneer up a tree to give warning of hostile attack from any direction. While the other cannoneers are carrying in the other howitzer loads and ammunition and assembling the piece, the chief of section goes on reconnaissance. He finds that the route to the battery rallying area ("B" on sketch) which looked so good on the air photos is impracticable and has to select another one. While doing so he finds an infantry parachute company that has landed in the same area and he establishes liaison with its commander. He learns its dispositions and points out the location of his section. He arranges for support of the company should it be necessary to repel an attack from any direction. Back with his section he supervises the completion of the assembly of the howitzer and the collection of all bundles of ammunition and supplies under cover so that the open area will be free for the landing of the gliders which are to bring in the next wave. When this work has been completed, he learns that the infantry has no immediate need for his support and according-

ly proceeds to bring his section to the battery rallying area which is more than half a mile away. First the howitzer must be moved by hand and later men will be sent back to carry the ammunition and other loads. The chief of section wishes for a moment that he were in a glider battalion, for then he would have a jeep to assist in moving. While the howitzer is on the move one of the battery instrument men who has landed with the section sees a German cavalryman come out of the woods several hundred yards away and return to them at a gallop when he is fired on. The chief of section keeps an eye on this locality as he knows the enemy will attack by any means available if he can do so before the units get organized on the ground.

When the sergeant arrives at the battery rallying area with his howitzer he sees that one section has already reached it and that the captain is giving final instructions to the executive before leaving to establish liaison with the infantry parachute battalion and selecting his OP's. The executive points out a position for the howitzer and an alternate one to be occupied in case of necessity. The piece is put in and laid and the sergeant sends back some of his cannoneers to get impedimenta that have been left in the landing area under cover. The third of the battery's howitzers appears at this time. Its crew has been fortunate enough to find a farmer's cart and donkey, thereby solving their transportation problem. There is no sign as yet of the fourth section of the battery but no time to worry about it either. An attack may be expected at any moment and it will be the job of the parachute elements to hold it off until the glider units arrive in the "Air-head" secured for them and to organize offensive action.

The three pieces of the battery are on fairly open ground with sufficient defilade but very little cover. The executive has consequently dispersed them, and they have good fields of fire in all directions. They have been laid pointing generally east, but a radio message received causes the executive to have them turned almost entirely around. This is no great surprise to the cannoneers, for they have learned from their drills and maneuvers that airborne units must expect to be engaged in any and all directions. Another quick shift and the pieces open fire almost simultaneously on a number of tanks that appear half a mile away and disappear almost as quickly. There is a crackle of small arms fire in the distance and then the radio is speaking again, and the fire of the battery is adjusted on some target invisible from the guns themselves. Surprised by our parachute landing at dawn and under almost constant attack by our air forces, the enemy has not been able to organize an attack in sufficient strength to interfere with the landing of the glider units of the airteam. The team is able to assemble without serious loss and to organize an attack itself on a nearby village ("D" on sketch) which is its first objective.

AIRBORNE FIELD ARTILLERY

The batteries of the glider field artillery battalion go into position according to the orders of their battalion commander who has landed with his reconnaissance parties with the leading glider infantry elements of the air team. The glider infantry moves up to its attack positions while one parachute company goes into reserve and the others continue to protect the flanks and rear. The parachute battery is manhandled several hundred yards (to vicinity "C" on sketch) to be able to support the attack more readily. It is able to borrow a jeep from a glider battery to carry forward some of its dwindling supply of ammunition. The infantry moves off to the attack according to the plan that has been worked out weeks before, and also according to that plan our planes attack the village with bombs and machine-gun fire. It is fortunate that they do for the supply of field artillery ammunition is barely sufficient for emergency needs, and none could be spared to fire a preparation worthy of the name. The field artillery, glider and parachute, has sent its forward observers out with the leading infantry units, but communication is difficult. Wire is very scarce and there is little time to lay it. Not all the radios have survived the shock of landing. Visual signalling and runners must be utilized. Nevertheless the howitzers are able to fire a number of concentrations on visible targets and the village is taken after a house-to-house fight.

The sun is getting low in the west. Darkness will give the air team an opportunity to link up the village it has taken with the rest of the division, and to organize a defensive to block Axis reserves who will be rushing to the coast to bolster the beach defenses opposing the landing of our sea-borne expedition. The chief of section hopes that it will be possible to bring in glider loads of ammunition before dark. Few rounds are remaining and the enemy may be expected to launch a coordinated attack by dawn or sooner.

The gains of the day will be lost unless the division can hold what it has won and prevent reinforcements from reaching the beachhead area and attacking the elements of our army that have landed from the sea.

By man-power the battery moves to another new position ("E" on sketch) prepared to support the defense of the village. The sergeant loses one man from his section to help man one of the few captured pieces of artillery. The captured pieces have a better supply of ammunition than our own. It is fortunate that all our cannoneers have been trained in their use. It is dark, but the work continues. All night long the few vehicles that have been brought in by glider haul loads of ammunition from the landing areas to the guns. With flashlights the men of the glider battalion survey section continue their work and "tie in" the parachute battery so that the firing chart will be ready before it is needed, and so that so much reliance will not have to be placed on forward observers and their precarious means of com-

munication. The cannoneers dig their trenches.

The next day and the day after the enemy attacks as expected. The battle sways back and forth. In its lulls, far to the rear can be heard the sounds of the attack on the beach defenses. A detachment of the antiaircraft-antitank battery of the parachute field artillery battalion has a busy time fighting off the attacks of the Axis dive-bombers. In spite of the utmost efforts to conserve it, ammunition is always running low. The landing area becomes too hot a spot to use, and it is necessary to resort to emergency means and drop some ammunition by parachute. In the middle of the second night heavy trucks are heard heralding the arrival of a battalion of 105's that has landed on the beach and been sent forward to reinforce the airborne division. All arrangements have been made for it by the staff of the division artillery commander. It registers one piece as soon as daylight permits and then its massed fires make the defensive problem an easier one. During the day infantry units also arrive after a long march. The crisis is past. The beachhead has been established because the airborne division has been able to keep the hostile reserves away from it.

As fresh troops arrive, the airborne division will be withdrawn for much needed rest, reconstitution, and reorganization. Will it be ready for another airborne operation next week? No, nor next month. Airborne operations require detailed advance planning even before the rehearsals start. The weeks or months of planning that must go before each successful operation suggest the extreme application of the "task force" principle. The area in which the troops are to be engaged must be picked. The air teams of the division must be carefully organized for the particular mission, and they must be rehearsed. There seems to be no reason why a particular armament for each operation should not be selected, particularly for the field artillery. There is bound to be adequate time to train with it. In an operation where the danger of mechanized attack is great and the possibilities of support by air considerable it would seem that the field artillery could be armed with a better antitank weapon than the 75-mm howitzer, although one less effective for general purposes. On the other hand, if the operation is to be in an area, jungle perhaps, where tanks cannot intervene it might be logical to arm the airborne field artillery with the 81-mm mortar, or some other weapon with which the loss of range would be compensated for by an increased initial supply of ammunition.

As will be seen from the above, airborne batteries will operate much like any other field artillery. They will have the same missions, but they will have to accomplish them with lighter armament, less ammunition, and very little transportation or signal equipment. They must make up for these lacks by training, detailed advanced planning, and initiative highly developed in all ranks.

With a Quartermaster Truck Company in the Middle East

The following letter from the Captain of a Quartermaster Truck Company in the Middle East gives a most interesting and valuable description of actual conditions in the field, and the suggestions on training will be of especial interest not only to those who are looking forward to foreign service but also to those in charge of preparing units for action overseas.

—THE EDITOR.

I'LL TRY and give you as much of the story as possible and hope that it may save some other fellow a lot of trouble (if they will only look ahead) when they go through this business of being in a strange land with a job ahead of them. I hope the censor will be kind and not take out too much.

Maintenance. As we are operating shuttle convoys, drivers' responsibility is hard to define. Ordnance is now doing more of the maintenance work. However, to start the thing rolling we were on our own, no wreckers, no winches, practically no tools. All we had were pliers, screwdriver, crescent wrench, and skid chains (also used as tow chains). Things are fairly well organized now. It was pretty tough starting out for some strange place with an odd name, no maps, no lights, strange and new vehicles, no idea as to distances, no maintenance, just their so-called "roads." The "roads" are the cause of most maintenance troubles. Lost gas tanks, generators shaken off, batteries jumping out of their cases and breaking the distributor caps and rotors (no replacement for them). I used my First Aid Kit adhesive tape till I ran out then used string. Then the changes in temperature are very difficult to keep up with. We had many cracked heads and blocks in our first blizzard. Prestone was then made available. Then when we would get back in the warm sector, they would get too hot. Inexperience in driving semi-trailers was the cause of most of our accidents. Jack-knifing on an icy road, driving too close on the desert and being blinded by sand were the main causes—300 to 400 yards distance is the minimum. A very important point to remember is to bring plenty of spare parts for overhead vehicles, $\frac{1}{4}$ and $\frac{3}{4}$ -tonners—starter generators, fan belts, etc. Especially see that each $\frac{1}{4}$ -ton is equipped with reinforcing for the back and helper springs. Put on everything possible. The greatest trouble on the $\frac{1}{4}$ -tons is the back falling out. Mine has been welded back twice and the springs have been completely replaced twice, with the exception of one which had a helper spring on it. The "roads" are really tough on them.

Supply. Supply at first was an unknown thing. However, now we are fairly well equipped. With so much rapid and rough moving we lost and had damaged a great amount of our organizational equipment. Several men lost all their equipment in fires, burning gasoline in tents to keep warm. It was quite a while before we got partial replacement. Strict checks and close supervision are necessary in order to keep and maintain the equipment. This should be emphasized in training, right from the start, before coming over. I could do better on this score if I were to begin anew. I have always thought that the T/O should call for pistols for officers and NCO's. Being here makes me believe it more. Rifles are awkward in a jeep. A shoe-repair kit per Company would be a wonderful thing. We went for months without any repair or replacement. Extra fatigues are a necessity. Bouncing up and down on the seat wears out clothes in a few days. Motorcycle belts would be a wonderful contribution to the protection of the man and his clothes. I've seen backs raw from the rubbing. Office supplies are important. There is plenty of paper work. Morning reports, sick books, duty rosters, etc., should be plentiful. Cleaning and preserving material is hard to get. Steel wool for mess kits, soap, etc., should be brought in enough quantity to last a few months. Bring some extra rags for kitchen use and general cleaning. Equipment should be packed so that the crates and boxes make a complete set-up; motor equipment in bins, office supplies in filing cabinets, etc., then all that is necessary is to remove the lid and go to work or, if you are to move in a hurry, replace the lid and move. Our record so far—eight moves in two months.

Discipline with certain types of troops is a special problem. Organizations that are well disciplined and trained have very little difficulty. Let me emphasize stability of character and the ability of individuals to practice self-denial. Diseases are prevalent among the natives. The venereal rate is very high. I have searched for the answer to this but evidently I can't adjust my way of thinking to theirs. Some non-coms can't take it and have become completely reversed. The weak ones develop a lack of initiative and would rather be privates. I have attributed a lot of this to the tough grind. Under these conditions some men get to the point of not giving a darn about anything. All they want is some rest and peace. Discipline is a major point for they are doing several jobs, driving, checking loads, etc., and putting up new camps practically every day. Discipline and general reliability are closely re-

WITH A QUARTERMASTER TRUCK COMPANY IN THE MIDDLE EAST

lated. Out here we value a man on how well he does the job when he is off by himself or with a detail of men, trucks, and valuable cargo. There eventually comes a time when your officers cannot supervise the whole show. My advice is to select the key men carefully from those of the *soundest character* for it's on *character* that real self-discipline, the kind you need out here, is founded. Beware of the NCO with a veneer of discipline and lots of lip service.

Field ranges with proper care and with fairly new parts to start with should give no trouble. The only difficulty is the rough handling in moving and lack of cleaning and preserving material. I happened to see our own ranges slip from the ship's hoist and bounce several feet. I closed my eyes and saw all the *cold* corned beef I was going to eat. Fortunately they were well crated and the only casualty was a door.

Convoy feeding. We have set up relay stations for overnight and noon stops. However, this is new. Our start was with "C" rations for practically three meals a day for many weeks and it got mighty tiresome. Then we started to get sandwiches for lunches and many a time there was no bread and you just didn't eat. At first we were out for 24 hours at a time. Breakdowns would delay the officers on the road and several times we were half a day behind the convoy, even after they had made their overnight stop.

Convoy control, as described in the book, is something there isn't much of. Noncommissioned officers have been doing most of it. It's practically impossible to police a column with a 400-yard distance and with over 50% additional vehicles than called for in the T/O—*sometimes 100% more*. The "roads" prohibit effective control, for the most part, for if there isn't dust or sand you are lucky to be able to make 20 MPH in a jeep, it's so rough. March graphs are unknown here. You start at sunrise and get in as soon as the roads and weather permit. Very few halts are made due to the distance and time factors.

TRAINING—in capital letters—the most important of all. To some, training may be dull and tiresome, but if everyone could be made to realize how important it is to have a *trained* unit before stepping into something like this, they would work night and day and put every available ounce of energy into their efforts. Then when they got overseas they would find that their efforts were not in vain. Their work and troubles would be inconsequential. It's the difference between a small amount of concentrated effort at home or suffering through a lot of hardships over here with constant headaches, heartaches, and weeks of futile effort. I'll sum up generally what I consider the more important points:

1. *Competent non-coms.* When the units get spread out and Officers are put on other details, you must have reliable non-coms to do the job. Implicit trust, initiative, etc., must predominate. They must be trained to do any job. Not just garrison soldiers where they look nice on the drill field, but out where life is rough and conditions are against you. This is where to find them. Weed out the "weak sisters" with utter ruthlessness. This is a game for men stout in body and character.

2. *Physical training*, never let down on it.

3. *Field conditioning* is important. Sleeping for months on the ground, no pay for months, no passes, no recreation, no luxuries, no PX, living and driving in mud, dust, sand, snow, blizzards, hail, rain, desert heat, etc., are common out here.

4. Attempt to create some entertainment within the unit before leaving,—a band, a quartet, etc.

5. Be prepared to eat plenty of corned beef in all varieties—hash, stew, and just plain—both hot and cold.

6. Be prepared to have a tough time of it. There are plenty of discouragements but eventually they all turn out for the best, if one keeps his chin up—and out.

7. *Maintenance of vehicles*—everlasting and meticulous. Care of arms and personal equipment not only against deterioration but against loss. Every officer and man must habitually inventory his things daily. It soon becomes easy. Frequently it is a tragedy to lose even a small item.

8. A poor outfit out here is a "stone around many necks." A unit that is just passable ("satisfactory") will fail. I would aim high and keep firing away every possible minute during the entire training period.

9. Don't just stop at the MTP requirements or T/O equipment. Have *every* man be able to do anything. It is tough getting a strange vehicle and getting in and starting off with no training at all. Cover everything—Diesels, semi's, Diamond T's, wreckers, etc. Be doubly careful about training in care of clothing and equipment. Have plenty of carpenters, cooks, clerks, etc., to fall back on. Every man should be a mechanic. I would certainly like to start all over again with a fresh outfit. There would be a pretty tough and long training program but I'll bet I would be a lot better prepared and things would be a lot easier for everyone in the long run.

Improvisations. I neglected to cover improvisations. Practically everything we do is improvised. Mess tables, orderly room, supply, training program (when we can). It's just a matter of catch as catch can. This is where NCO's with initiative, resourcefulness, and dependability prove their worth.

In Memoriam—Militär-Wochenblatt

THE *Militär-Wochenblatt* IS DEAD! After a hundred and twenty-seven years of varying fortunes the world-famous German military weekly has quietly ceased to exist—just at a time when its health should have been at its best. It seems strange indeed that such a magazine should have continued uninterruptedly through decades of peace and then fallen by the wayside when interest in things military was perhaps never so high.

On 1 July 1816, E. S. Mittler began the publication of the "Military Weekly," and 127 years later it was still being published by his descendants through the firm of Mittler and Son of Berlin. In the course of this long period the magazine went through many changes in character, size, style, number of pages, and even in frequency of publication although in name it always remained a weekly. At times it appeared twice a week and for many years, including the years of World War I, three times a week, and innumerable supplements were published in addition to its periodical issues.

From its beginning, the *Militär-Wochenblatt* seems to have maintained close relations with the General Staff of the Prussian Army, and seven years after the first appearance of the journal the General Staff, by order of the King of Prussia, took over its editorship. For forty-three years, according to an historical note in the 125th anniversary edition, 4 July 1941, it remained the official publication of the Prussian General Staff and the Ministry of War. During all this time it strove to carry out the royal instructions, "to contribute through a suitable selection of articles to the proper development of the younger officers of the army," and in this it was aided by the policy of the editors of encouraging contributions to its pages by especially well-informed officers of the higher ranks.

In 1867 Generals von Roon and von Moltke gave the *Militär-Wochenblatt* the status of an independent publication. At this time its mission was defined thus: it was to serve primarily for the scientific stimulation and instruction of officers of the army, but at the same time it was to be a medium for the presentation of the interests of the military to the general public—it was to become, as it were, the public representative of the intellectual life of the army. To carry out this mission, its editors, with the cooperation of members of the Officer Corps, encouraged a free exchange of opinions by means of which problems of the army and

of military strategy and tactics might be clarified. Indeed, it seems that the *Militär-Wochenblatt* was sometimes allowed a surprising amount of leeway in analyzing even official military policy.

The years following the World War were hard ones for the publishers of the *Militär-Wochenblatt*. After the coming of Hitler to power, however, the old journal took a new lease on life, and never, perhaps, did it appear more prosperous and energetic than in the later 1930's when preparation for war was a vital force in Germany.

In 1941 Colonel General Franz von Halder, Chief of the General Staff of the German Army, eulogized the magazine in these words: "The *Militär-Wochenblatt* can, with justifiable pride, look back on a long period of intellectual effectiveness, on times of great wars in which it wrote of the fame of the Prusso-German Army, on bitter years which it survived with the German Army in the fetters of the Versailles Treaty, and finally on the years of resurrection in which it shared in the magnificent and unparalleled building up of National Socialist Germany achieved by the Führer. And when, after the mighty battles of the present war, the glorious deeds of the army are published, when the experiences and lessons of the war are to be gathered together, clarified, and arranged in useful form, then may the *Militär-Wochenblatt*, true to its traditions, do its part in this. May the best ability be found cheerfully ready for co-operation. That is the wish of the Army General Staff today."

For the student of the history of a people as closely identified with their army as the Germans have been, a careful study of the *Militär-Wochenblatt* through a century and a quarter should provide a rich mine of material. For the student of military literature and military problems, the passing of the *Militär-Wochenblatt* will produce a feeling of sincere regret. Its articles carried many lessons, and it was watched with interest by students of military affairs throughout the world. The Command and General Staff School MILITARY REVIEW owes many a valuable note and interesting article to this source.

The true cause and significance of the demise of the *Militär-Wochenblatt* is not clear at the present time, but the least that may be assumed from its passing is that all is not well in the camp of our enemies!

FOREIGN MILITARY DIGESTS

Tank Battle In Tunisia

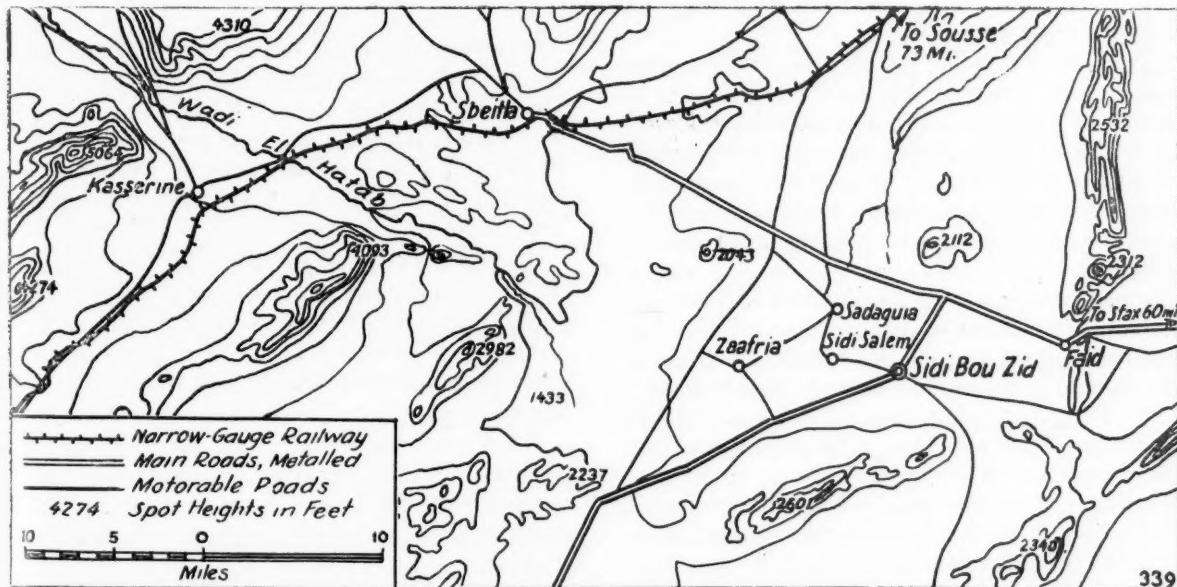
[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Lieutenant Kurt E. Wolff, German Army, in *Das Reich* 11 April 1943.]

IN A roaring attack, we captured the village of Sidi bou Zid, occupied by the Americans. We went in behind their batteries, destroyed a large number of American tanks, and by late in the afternoon our objective was reached.

On the next day we consolidated the terrain we had won. The 2d Battalion was located in the southeast; we, the 1st, in the southwest, the companies

arrived. After a series of fine victories we were all in high spirits and we had the assurance that we would advance rather than wait or retreat.

But scarcely a half hour had passed before the communications officer, who from time to time had been scanning the distant horizon from the top of the turret, caught sight of clouds of dust in a direction from which, in all probability, no one but the enemy could be coming. After a few minutes we knew that tanks were approaching from the west and while I was still searching for my maps which were in the personnel vehicle the commander determined the form the combat was to pursue—in accordance with his own desires.



widely separated with kilometers of space between them. It was evident that the enemy had retreated a long distance. Even his artillery, which usually was active, was quiet.

And so everything was almost peaceful for us. The men were handing out and exchanging a few articles captured the day before; a few were writing letters again, the first for a long time. Our unconquered tanks stood alongside the clusters of cacti and glinted in the sun.

At about 3:00 PM I went to see the commander who was some little distance back of my company and was just in the act of preparing coffee when I

Those are stirring moments when a plan based on the unknown is being formulated. We counted thirty enemy tanks, but who could say that others were not waiting in the depressions, ready to circle around our wings? The enemy tanks were rolling toward us, 5,000 meters ahead of my company. In ten minutes perhaps they would be opening fire, and we were still alone. The other two companies were farther to the south and probably hadn't the slightest idea of what was going on. We had to act. The enemy already was acting. Thinking is of value only when translated into orders and deeds.

While I was still getting my motor started the

MILITARY REVIEW

commander called out his orders to me: "Drive straight at the enemy and stop him! The 1st Company will be led into their flank. Do not retreat under any circumstances."

Then, with my own company, I transmitted the orders to my platoon as we rolled along. Ahead of us lay a flat hill overgrown with cactus, which we had to reach as our first objective. We would be in such an excellent position there that we would be able to offer very strong resistance. Ahead of us lay a level area about 800 meters across, which each of the enemy tanks would have to pass if they did not recognize us in time and turn off.

When we finally reached the hill we could see every detail of the American tank battalion. We recognized over fifty tanks of the heaviest type—this was their superiority!

We had to remain calm. The situation was as follows: To the right and back of us was Sidi bou Zid, the attack objective of the Americans. Four or five kilometers to the left of us was the 1st Company which was just starting out. Ahead of us fifty or sixty American tanks were approaching from the west. Regardless of consequence my company had to check them until the 1st Company could reach the enemy right flank. When that occurred we could calmly await the attack.

Also, northeast of Sidi bou Zid there was another German tank regiment. The enemy appeared to be aware of this one only, for part of his tanks went plunging past us on the right without any hesitation, their broadsides toward us. However, the main body of them gradually approached to within 3000 meters directly ahead of us where they stopped. We awaited new orders.

The commander was to my left and had but two thoughts. What is the enemy going to do now, and when will the 1st Company be in position? "Step on it! Step on it!" was his radio order to the commander of the 1st Company. My company, the 4th, could do nothing further. We had our orders and had to wait until we could carry them out.

But time was passing and the Americans were still at halt. Were they uncertain about something? Were they going to change their plans?

In this case the law of the coming hour had to be imposed on them! They still had the upper hand, if they only made up their minds quickly. They could come tearing into us, crush us, and gradually make their way into the flank of the neighboring regiment. Our 2nd Battalion was still southeast of the village, but tanks which had broken through the enemy's lines had already half won the victory. Were they going to act?

While such thoughts were racing about in my brain, we received the order: "4th Company attack!"

Attack! I was forced to stop for a moment to think—had the commander seen the open plain that was ahead of us? But again the order: "Attack!"

There was, therefore, nothing to do but carry it out. And it had to succeed. Perhaps every man in my company recognized that in this way we would gain back the small amount of time that separated us from the 1st Company. So far we could see nothing of it, but it must be very close to us—otherwise the order would make no sense.

And so we had to be on our way. I had the last platoon veer to the left so that it would get the side of the enemy in front of its guns. The right platoon made the first dash across the broad plain; the center platoon followed three minutes later.

We got to within about 2000 meters of the enemy. It was simply incomprehensible to us, but he was staring straight ahead at the tank regiment far to the right of us which apparently was also in motion, and not one of the enemy tanks turned its turret toward us.

Just at this moment our artillery began to lay its fire down on the approaching enemy. It did the very thing we needed. The enemy became uneasy. We were able to improve our positions. I could shove the left platoon forward and move the center platoon across the plain. Everything was moving along as if on the training field.

The commander saw his 4th Company advance. We received the order not to fire under any circumstances. We were still 300 meters too far away for our fire to be effective. So we had to wait. My men kept estimating the distance to the white steel bodies of the enemy and asking excitedly when they could begin to fire—the shells were already in the firing chambers.

But the 1st Company was still 1000 meters too far away. Nothing but an attack could bring a decision now. Just at this moment I caught sight of it as it came into view over a broad front to the left of me and about even with me, moving slowly through flat depressions.

Then when the artillery ended its fire we received the last orders: "Fourth Company open fire; 1st Company attack the enemy on his flank." And then a little later: "Fourth Company continue to advance."

Victory was between these orders, for scarcely had the first shells left our guns than the first three enemy tanks were on fire. They were burning. The flames were red and the first billows of smoke over the field of battle were dark gray and black. Any one who has ever been in a tank battle knows how the heart beats when the attack starts rolling. There is nothing happening, only the noise of the motors is there—and the waiting enemy. But when the first shells have found their mark and the first red fire is seen on the horizon, then the heart is relieved and the feeling of danger of not being able to weather the storm has disappeared.

Scarcely had I reported these shots when the 1st

Company was also on the enemy. We saw from the left the streak of their tracer shells. We saw them as they continued to fire. There were very few orders now. Everyone knew what he had to do, namely, keep after the enemy. When the 1st Company gained a new position farther forward, my tanks made the same advance. There were at least fifteen burning tanks ahead of us and the most advanced of our tanks were already making their way between the destroyed American tanks to those in the rear.

The adjoining regiment on the right had also come up during this time and had knocked out the foremost enemy tanks which, in the beginning, had driven past us on our right. The remaining enemy tanks had retreated, and had passed us in such a favorable position that the platoon on the right had a special battle of its own.

In addition, one company of the 2nd Battalion had come over to our commander of its own accord and had asked for orders. Since our 2nd Company was too far away to be brought into the battle at the proper time, this request was not unwelcome to our Major. When he saw the favorable turn the engagement was taking, he was able to use these new tanks over a broad curve to our left alongside the 1st Company, and thus to thwart the enemy's efforts when he finally turned to flight. Later, when everything was over, only a single enemy tank had escaped our guns to carry back this day's report to its vanquished general.

It was gradually growing dark. Today I remember very incompletely the various radio conversations. There remains with me only the overall view of the field of battle before my eyes, the little village of Sidi Salem which we had gradually taken in our advance, the surrounding hills on which, lined up as if for a picture, the burning American tanks stood, and our commander who, laughing like a boy, went from company to company asking us and himself too: "Did you ever see anything like it? Did you ever see anything like it?"

Early in the morning we desired to move against the English. Field Marshal General Rommel is not the man who lets his tanks have a great deal of rest so long as the motors are still running and there is enough ammunition.

But there was one sergeant that I will always remember. He had come over to us from the infantry a few weeks before, and now in this, his first tank battle, he tore into the enemy tanks with the total unconcern of a man who knows that there are several centimeters of steel around him and who is, therefore, apparently invulnerable. He could hardly speak as he stood before me later and reported his shots. When the company was assembling he was still pursuing the few fleeing tanks which the 8th Company afterward annihilated. He stated that he had heard no radio orders and had known of nothing but the white American tanks rolling ahead of him, and he

believed that these also had to be set on fire. Just as I, with my company, was being assigned a new security area and darkness was coming on, he arrived all out of breath with his report.

We had destroyed a whole tank battalion. It was truly a rare day. We had won other victories, we had seen the capture of Tobruk—bright days—but in between them dark days also, when the superior enemy forces facing us at El Alamein forced us to retreat.

And then the memories of victories such as that at Sidi bou Zid accompanied us as if they had been standards. When tanks attack, ten times their strength must oppose them if they are to be halted. Thirty of them cannot annihilate three hundred, but if necessary they can be buried in front of the enemy's batteries. In between times there are always bright days such as the one of which I have told, and which did not cost us the death of a single one of our comrades. I can still see the long line of fires in front of which our tanks cruised up and down, their engines humming, calm yet proud after a good day's work.

Land-Air Technique In Africa

[Extracts from an article in *The Royal Air Force Quarterly* (Great Britain) June 1943.]

THE FIGHTER-BOMBER has been the backbone of the close-support force throughout the whole African campaign. It was born in the Middle East and it has proved itself there and in Europe to be superior to the dive-bomber in many important respects. It is fast, combative once its bombs are dropped, can make surprise low-level attacks, and can operate effectively without fighter protection. It is essentially a fighter carrying bombs (usually two of 500 pounds) and is not a substitute for the light bomber, nor is it a dive-bomber in the limited "Stuka" sense. There is no disputing its effectiveness as a ground-strafing weapon. As such it is something of a battle winner. And in recent months there have been many signs that the Germans are of this persuasion. In February, just after the Axis had failed in their attempts to dislodge the Allies in southwestern Tunisia, the Air Ministry made some interesting comments on the subject.

It was stated that, contrary to what is frequently asserted, German faith in the dive-bomber appears to be waning. At the time of the Battle of Britain the German first-line strength of Stukas, which is the only type of true dive-bomber the German Air Force has ever possessed, was over 500. Today there is good reason to believe that it is of the order of 300, so that the dive-bomber is waning in the battle-order of the German Air Force. Our air forces are now increasingly meeting with ground-attack units called Schlacht units. They consist of fighter-bombers es-

MILITARY REVIEW

sentially similar to our own. The Germans employ in these units all their well-known types of single-engine fighters, Messerschmitts 109 E, F, and G, and Focke Wulf 190. The extent to which they rely upon fighter-bombers now is shown by the fact that at least 80 percent of all the army support work done by the German Air Force in connection with Rommel's long retreat from El Alamein to Castel Benito was performed by the single-engine fighter-bombers.

The tendency for the German Air Force to rely decreasingly on Stukas and increasingly on these Schlacht units with fighter-bombers is shown by the fact that since the autumn of 1940 the production of Ju. 87's has been allowed to decline. Certain squadrons of Ju. 87's have been allowed to go out of existence altogether and have disappeared from the order of battle of the German Air Force. In the German offensive in Southern Tunisia (15th to 20th February) there were about an equal number of dive-bomber sorties and fighter-bomber sorties, about sixty in each case. On the second and subsequent days few, if any, dive-bomber sorties were made, but there were a large number of fighter-bomber sorties. There were about fifty Ju. 87's in Tunisia, of which about forty were present at the battle. The continuing mis-reports of the presence of important forces of Stukas or Ju. 87's in the Mediterranean theater and of their attacks on Allied troops may be attributed to several factors, of which one is the difficulty of recognition, especially on the part of troops not well experienced in meeting this type. On many occasions later evidence has led to the identification of aircraft at first supposed to be dive-bombers as fighter-bombers.

For example, in the Southern Tunisian battle many of the attacks originally thought to have been carried out by Stukas were in fact the work of fighter-bombers. Another example of this erroneous identification is afforded by reports of attacks on our own south coast. These are frequently reported as dive-bomber attacks; they are invariably carried out, however, by fighter-bombers. The causes of the Allied reverse in Southern Tunisia, so far as the air is concerned, are to be found in the ability of the enemy to concentrate superior forces not merely and not principally of dive-bombers but of aircraft of all kinds as well as indeed of ground forces at the particular time and place chosen by him for the battle.

The German Air Force in Tunisia had been approximately doubled by the transference to that province of the air forces formerly in Tripolitania. For a short period it was not possible for the Eighth Army and the air forces with it to reach the scene of battle. Hence the entire weight of the combined enemy forces could be thrown against the Allied forces available in Tunisia. It is also clear that in the retreat from El Alamein the German Air Force suffered prodigious losses when it used Ju. 87's extensively.

Very many valuable lessons have been learned by the army and air forces in Africa and we shall have to wait to see how they are applied in future campaigns. But one thing has been definitely and clearly established; a close and permanent understanding between the soldier and the airman. It has been hard won—a marriage of true minds—with a honeymoon in Tunis. The old distrust and indifference has disappeared and in its place has come the closest possible integration of effort. No doubt there is room for improvement in detail—there is bound to be—but broadly speaking cooperation, strategical and tactical, has been brought to near perfection. Soldiers and airmen work side by side, laying their plans. In the field the commanders live together. Before battle the soldier indicates the strong points which he expects to give trouble and the airman directs his squadrons against them.

The theory of cooperation is now well understood and it has been successfully applied. But the success depends on two factors, and these have not always been present and may not always be present in the future; superior numbers and air supremacy. The second should follow from the first, but it is not always so, for in the battle area much depends upon the possession of fighter bases in the right place. In the matter of bases the army can help the air. "In a present-day campaign there is always bound to be a furious air-to-air struggle for supremacy," said Squadron Leader John Strachey in a recent broadcast. "It is only to the extent that you can get on top in that air-to-air struggle that you can turn your full attention to blasting the enemy on the ground, and at sea, in combined action with your own ground and sea forces." The overwhelming supremacy which we eventually won in Tunisia was at one time rather remote; we were no more than holding our own. In future we can hope to start with sufficient aircraft to force the issue at the outset. In the Battle of Egypt, the Western Desert Air Forces did win the air struggle and quickly, so that for their long advance across the desert the Eighth Army had nothing to fear from the Luftwaffe.

Of course, this army and air force cooperation has become much more than simply a matter of close support. That has been outgrown and the conception is now all-embracing. In its way the work of the strategic air force was as necessary to the army as was that of the tactical, though the soldier who can see the fighter-bomber doing its job on the spot may naturally rate its work higher than that of a fortress dropping bombs on a supply base two hundred miles away. The bombing of Tunis and Bizerta and other Tunisian ports was a great contribution to the victory and between them the navy and the air forces made supply very costly for the Axis. The harbors were full of sunk and damaged ships, some of the few that had eluded the navy. In the closing stages of the campaign we saw how the navy's

task in frustrating evacuation was made easier by the air force blitz on the beaches and small shipping inshore. It is obvious that close cooperation between sea and air in such circumstances can leave few loopholes—always providing that the aircraft are used in large numbers.

An intrinsic part of this new weapon of unified land and air attack is organization, and in this department much has been achieved. Without first-hand experience it is not possible to describe in detail what has been done, but the scale and intensity of our operations in the big battles of the past seven months show that the men on the ground are able to cope with a situation that demands between two and three thousand sorties in a few hours. In supply, too, there have been many improvements. Air transport has been used on an increasing though still small scale, and we had experience in the moving of whole squadrons by air in the pursuit of Rommel from El Alamein. In North Africa our own transport force has been supplemented by American Douglas aircraft, and it is clear that for effective supply great numbers of transport planes will be needed. Other advances in ground organization have been the creation of the R.A.F. Regiment, which first went into action in the Battle of Egypt when it captured some airfields; and the special servicing commandos, fast mobile units which are used to look after the aircraft occupying hastily created forward bases. In the desert the laying out of these landing-grounds in advance of the army was a special problem and the work was done in cooperation with the Royal Engineers. In Europe the problem will not be quite the same but the experience gained in the desert in mobility and flexibility in organization will be of great value.

Finally, what of the merits of the opposing aircraft upon which depends the result of that air-to-air struggle? Africa has proved that the single-seat fighter is the basis of air mastery, and in that category we hold a trump card in the Spitfire. The Mark IX, whose presence in Tunisia was reported, can outfight the enemy's best. Backing their short-range supremacy the Allies have the powerfully armed Fortress long-range bomber. The two are complementary and their combined hitting power is of major importance. Behind these two come a string of first-class machines — Hurricanes, Kittyhawks, Warhawks, Airacobras, Beaufighters, Wellingtons, Liberators, Bostons, Mitchells, and Lightnings. It was this array of types that gave the Allies such flexibility in their striking power. There is quantity and quality here, and while a diversity of types suits our strategy and is necessary to it we cannot afford to overlook the paramount importance of all-round supremacy in fighter aircraft. If the enemy could produce a winner in that class our growing mastery might be temporarily upset. We have reached a point now where the Allies must keep ahead.

Bridgeheads

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Paul Hasse, General of Artillery, Retired, in *Neues Wiener Tagblatt*, Vienna, Austria, 29 June 1943.]

A BRIDGEHEAD is a supporting point on the far side of a body of water, taken possession of by an advanced force while the main body is still on the near side. Its tactical purpose may be either offensive or defensive. The famous Kuban bridgehead [east of the Crimean peninsula] was first formed for offensive purposes when German forces had crossed the lower Don and were pushing toward the Caucasus. When the Soviet winter offensive made it necessary to withdraw from the Kuban region, the mission of the bridgehead became defensive, providing security for the Crimean peninsula which in turn provides protection for the southern wing of the whole eastern front.

There are two decisive prerequisites that must be fulfilled if a bridgehead is to be held and employed as a basis for further operations. First, a flow of supplies must be assured, and second, the men in the bridgehead must be reinforced before they are annihilated or compelled to withdraw. The bridgehead east of the Don at Voronezh had to be evacuated when Soviet attacks to the south caused its contacts to be broken by the displacement of our front rearward. Since Soviet pressure was not directly against the bridgehead, the evacuation was carried out in good order and without the loss of heavy weapons.

The situation in Tunisia was wholly different. Tunisia, which was the forefield of the European defense front, had to be held until the work of fortifying the European coast was completed. Thanks to the mistake of the American command in not immediately including Tunis in its occupation of North Africa, the Axis got possession of Tunis by quick action without a battle, and thus widened the bridgehead. But in the further course of events the enemy was able to increase his air and naval strength to such an extent that the flow of supplies across the strait between Sicily and Tunisia became increasingly difficult and finally impossible. In addition, the Anglo-Americans were able to increase their combat forces to almost a million men with the help of the de Gaulle French and their black colonial soldiers. Thus, not only were the Axis supply lines cut, but the retreat of our forces became impossible. Their resistance, which the enemy's superior numbers alone would not have been able to break, had to end with the last cartridge. Hard as this blow was for Germany and Italy, our heroic fighters had accomplished their great and decisive mission. Tunisia had served its purpose as the forefield of Europe. Today the Mediterranean coasts of France and Italy, including their great islands, Sicily, Sardinia, and Cor-

sica, are just as strongly defended by fortifications and heavy cannon as the Atlantic coast has been for a long time.

The Americans and the British have established themselves now, in the eyes of their Bolshevik comrades in arms, their own peoples, and the world, in such a way that they can no longer back out of their attack on Europe without incurring Stalin's sharpest displeasure and without losing all the confidence of their own people. Europe will have to expect that some dark night the Anglo-American forces will try to make a surprise landing somewhere on her coast and form a bridgehead, or even several bridgeheads. It will be the task of the coast guard service to recognize which is the main effort and which are only diverting efforts.

Here is where the enemy's difficulties will begin. The fighting strength of the first landing forces will have to be limited. If any success is to be expected, a heavy flow of supplies and reinforcements will have to follow. An enormous number of freighters will be required, protected by a mighty fleet of warships. The defense of all these ships against the air forces, naval forces, and coastal batteries of the Axis will be a difficult and costly, almost an impossible, task. But even if the landing operations succeed, then very quickly the invaders will be confronted with rapidly increasing Axis forces which will enter the fight fresh and rested, with protected transportation and supply routes.

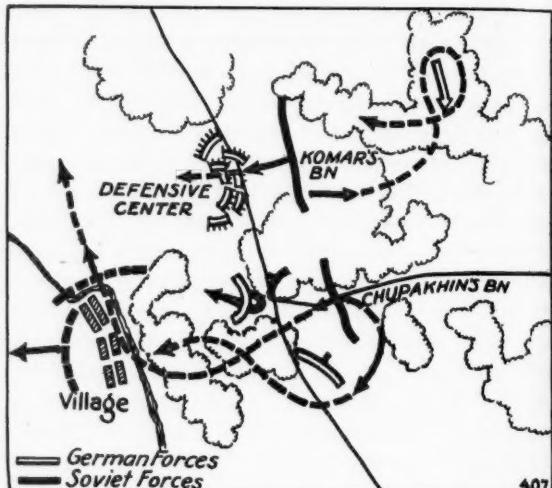
Gallipoli, Narvik, Dieppe are examples which should be a warning against such operations. Annihilation would be their fate when the hopelessness of the attempt finally forced the enemy to withdraw across the sea. Dunkirk would be but a small sample of the catastrophe that would follow.

Help for the Neighbor In Combat

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Captain of the Guard S. Tsybulin, Soviet Army, in *Krasnaya Zvezda* 23 May 1943.]

FREQUENTLY, during combat, skilful and prompt aid to the neighboring unit is of extremely great importance and in the final result insures general success. It is not simply a matter of helping the neighbor at a critical moment with part of one's own weapons and personnel, or of participating directly in the solution of his personal problem. It is important to find a solution which will basically change, in his favor, the tense situation developed about the neighbor, and which, at the same time, will bring about the successful accomplishment of the general mission. It is indisputable that such help is always possible under conditions of close tactical contact between neighbors.

The battalions of a certain unit were ordered to capture a village, which was a difficult task because the wooded region, dissected by ravines and hollows, permitted the enemy to advance many small groups and to establish ambushes and listening posts covering the approaches to the intermediate lines of de-



fense. On his left flank the enemy constructed a fairly strong defensive network on the slope of a low hill, building four lines of field fortifications one behind the other.

Our battalions moved forward, sending out reinforced reconnaissance and taking measures of security. Along a wooded hollow to the right, the battalion under command of Senior Lieutenant Komar advanced in the direction of the enemy's main defensive center. The second battalion, commanded by Captain Chupakhin moved along somewhat to the left against the village which was to be captured.

In the beginning of the attack nothing very unexpected was observed. Reconnaissance made timely discoveries of small groups of the enemy. Defeating these groups with flank blows, Komar's battalion emerged on the edge of the wood and appeared directly in front of the enemy's defenses. Captain Chupakhin with his battalion, having successfully liquidated a hostile covering force, moved out into a clearing where the road ahead and the approaches to the village were clearly visible. It seemed as if the goal were near. But the further course of events suddenly brought out a number of surprises that required considerable expenditure of effort by the attackers.

As soon as Komar's battalion began to approach the enemy's strong point, the enemy opened very heavy fire. The battalion was forced to stop and open fire in return. Chupakhin's battalion, having reached the open area, was about to attack energetically but was also met by strong frontal fire and took cover. Soon it became evident that the enemy was not restricting himself solely to fire. He attempted to outflank Komar's battalion, which had approached close to his defensive position, in order to destroy it and

then turn all his forces against the other battalion which was threatening to break into the village. A fairly strong group of Germans [see arrow upper right corner indicating enemy movement] was discovered by reconnaissance moving to cut off Komar's battalion and strike it from the rear.

The situation quickly became extremely critical. On the one hand, Komar's battalion had to continue to fight with intensity against the defending enemy, in order not to be counterattacked from the front. On the other hand, he was threatened by the danger of being cut off and attacked from the rear. Where one enemy group had gotten through, larger German forces could follow. It was necessary to liquidate this danger without delay. Selecting two squads under the most experienced officers, Senior Lieutenant Komar sent them to fight against the hostile group coming in on the rear.

Captain Chupakhin clearly saw the complexity of his neighbor's situation, but he himself was under powerful hostile bombardment. How could he help his neighbor in a manner that would be most advantageous for general success? He could concentrate his forces against the defensive center of the Germans on the hill, which, of course, would considerably weaken the pressure on a section of the neighboring battalion, but this would not lead to the attainment of the final goal—the seizure of the village. So Chupakhin determined that, regardless of the critical situation of his neighbor, it was better in the given instance not to be distracted but to hasten with all forces to overwhelm the village, and then to surprise the Germans by coming to the aid of his neighbor and disposing of the enemy threatening him.

Moving machine guns to the flank and sending out a group of tommy gunners on a flanking movement, Chupakhin liquidated the German machine-gun nests in front of him fairly rapidly and crushed the enemy blocking his way to the village. Then he seized the outskirts of the village and carried on a determined struggle for its capture. The enemy, not expecting so vigorous a blow at this point, began to fall back, and soon the village was completely cleared of Germans.

But the enemy continued to defend himself on the hill, keeping pressure on Komar's battalion which now required the help of all forces. This help Chupakhin brought about with an energetic action. Without stopping in the inhabited place, he sent out a force in observation to the west and himself turned almost at a right angle and continued his movement, thus coming out in the rear of the Germans defending the hill.

The situation at once changed abruptly in our favor. Now it was not our units but the enemy's that were threatened with encirclement. Taking advantage of the change in the situation, the tommy gunners of the first battalion cut off the German group in the rear and almost completely liquidated it while

the battalion commander Komar turned all his weapons against the Germans who were dug in in defensive positions. Under increased pressure from the front and threatened from the rear, the enemy quickly began to move to the northwest to avoid being surrounded. Having completely overrun the enemy defensive centers, Komar's battalion reached the village.

The battle lasted more than eight hours. The Germans lost about 300 men killed, not counting other losses; they left 8 heavy and 9 light machine guns, many tommy guns and rifles, and much ammunition. The victory was attained by the determined actions of both battalions, skilful mutual support, and co-ordinated moves prompted by the dynamics of combat.

Forgotten Men of the Bridgehead

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Dr. Wilhelm Rey, war reporter, in *Das Illustrierte Blatt (Frankfurter Illustrierte)* 1 May 1943.]

The article which follows, while apparently written for the consumption of those who care more for the histrionics of battle than for the techniques and methods involved, brings out a rather important side of river crossings.

In the planning of most river crossings the higher commander specifically assigns portions of his command to make so-called "feints" at some distance from his projected main crossing fronts, the purpose being two-fold: to draw the enemy reserves to the "feint," or if not successful in this ruse to let his "feint" become the main crossing front.

Generally the units making the "feints" become the forgotten men of the action as a whole.

Here, at least, is one man's report and reaction to his unit's travails as the "feint."—EDITOR.

1.

"IT'LL HAVE to start soon," the assault pioneers at the boats and the tank grenadiers were saying. It was the hour between night and day; the stars were dimming, the sky was losing its velvety dark depth, the light was still very faint, and the moon was sinking coldly to the horizon. The assault pioneers at the boats and the tank grenadiers stood ready for the dash across the river. Some were smoking a last cigarette, but in the fashion they had learned at listening posts close to the enemy, smoking with the glowing, shining end of the cigarette concealed in the hollow of the hand.

Then began the artillery fire which was to cover their dash across the river. Behind them a roaring began; it came howling up over them and burst with

a crash on the hostile bank. It was not coming from the barrels of a single battery—from many muzzles the bellowing annihilation broke out, tore raging over them, and crashed down on the opposite bank. The earth quivered under the turmoil of bursting projectiles. The air seemed to disintegrate in the howling uproar.

The assault pioneers and the tank grenadiers could no longer distinguish discharge and impact. They heard only a uniform detonation. But one sound rose above the others, a strange sound, in which there was the presentiment of the destructive power accompanying it—the hissing scream of the projectiles leaving the guns, tracing their paths in flame through the twilight of the sky. Here it broke out, the basic force of war in flame and roar, and it shook the solid order of nature in ever new turbulence. The far bank seemed to be boiling. As if from the orifices of innumerable volcanos broad clouds of smoke from the explosions kept rising; tall fountains shot up and shrouded the riverside in a deadly fog. It no longer dissipated. It stood immovable, shot through with flames.

2.

"Forward!" cried voices in this thundering chaos. How long had it lasted? An eternity? Yes, an eternity of two furious minutes in which the assault pioneers and the tank grenadiers rushed out of their shelters, put the boats in the water, and arranged them for the advance across the river. Now the fire of the artillery was raging on the intermediate terrain between the river bank and the village over yonder, and then the fire broke with undiminished power on the edge of the village, which the enemy had occupied in large numbers. Under the protective umbrella of this terrible fire the tank grenadiers got across the river; they dug into the earth on the other side, they fought their way forward with assault battalions following them—the start of the bridgehead was achieved.

3.

"Damn it, things are getting tough," the tank grenadiers said to each other, for the enemy was making himself felt more and more. At first his artillery, as if stupefied by the force of our fire, had been able to make only feeble efforts at defense, but now it was firing with good aim. Losses occurred under the hostile infantry and mortar fire, but the tank grenadiers fought their way forward step by step. However, they lay in open fields, and the enemy had good cover at the edge of the village in organized field positions, in bunkers, in a tank ditch. A large number of medium and heavy mortars, emplaced out of sight, covered almost every square meter of the riverbank territory. It was impossible to silence the well-camouflaged mortars by our own artillery. It was impossible to reach the edge of the village. The crossing of the river was forced but the attack had stalled.

4.

"We're stuck," the tank grenadiers said, lying in the hostile fire, and fearful days came on for them. As it became noon, evening, and night over the earth, as the sun rose again and set once more, as at home life went on as usual, the school children went to school freshly washed, learned their lessons and raised a racket in the recesses, as the machines continued to run in the factories and shops, the trains arrived and departed on time, the films ran in movie houses and theaters where every seat was filled, and orchestras played in the cafés—that is to say, as life went on just as it did every day, the grenadiers in the bridgehead had to endure the severest tests. The will of the enemy to annihilate them was implacable, the disadvantageous nature of the terrain was irreparable. They placed their hopes in the tanks, which would cross the river and help them—but how could the tanks get across the river since the hostile mortar fire covered the place of crossing mercilessly and half the assault boats were already lost? They placed their hopes of success in bringing the tanks over at a place farther up or down the river; but then the unhappy news reached them that a strip of clay 150 meters wide which extended along the riverbank would not carry any heavy weapons. In spite of that, their comrades on the other bank tried to get a ferry in operation, but this failed at the very first attempt; prime movers and boats were destroyed by hits while moving up to the bank. Ferry operations by day were therefore impossible and by night only mortars and heavy machine guns could be successfully brought across the swampy riverbank terrain. Thus further attack was quite impossible; at best, the bridgehead alone could be held.

5.

"Is there any sense in staying here?" the tank grenadiers asked themselves as they lay like lost souls on the hellish bank and the enemy let loose on them all the terrors of war. For hours they lay in the nerve-shattering thunder of hostile mortars; the raging attacks of salvo guns broke upon them, and at all times of the day and night they were exposed to the rolling bombardment of fliers whose target was the narrow combat area. They had no heavy weapons on the ground and they could not even get reinforcements any more; only the artillery on the other bank could still support them—and then the enemy advanced. He sent increasingly larger formations to storm the weak German semicircle; at first two companies attacked, then a battalion, then a regiment—but the tank grenadiers repulsed every attack. Then two regiments came at them—and this attack also was beaten off. The enemy, embittered by his series of defeats and resolved to remove the bridgehead, cost what it might, gathered a still greater number of troops in the rear and brought up reserves from other places in order to throw them at the compact cluster of German defenders. After three days this small

group saw a force in front of it larger than a division. "Is there any sense to this?" the individual tank grenadier might now well ask himself as he lay firing against this overwhelming force, for he did not know the plans of the command. But he trusted it and—he did not yield; he held on; he held the position. And that which he did made good sense, for through their inexorable resistance the tank grenadiers had compelled the army to send so many forces against them that the neighboring divisions found only slight resistance. And so, after some days, success was achieved at another place, success which was lacking here and yet had been obtained here—a bridge across the river. The name of the village is marked with great letters in the history of the division, not as a place of dazzling victory, but of sacrifice and that last test which even the harshness of this war rarely demands.

Russian Defensive Tactical Developments

[An article in *The Tank* (Great Britain) June 1943.]

THERE HAVE BEEN striking and radical changes in Russian tactical methods of defense since the first battles of 1941, as a result of the experiences of the last two years' campaign with its vicissitudes of victory and defeat. Such modifications in peace-time doctrine in the light of practice on the battlefields are of course normally to be expected with any alert and progressively-minded army, but the speed and thoroughness with which they have been carried out in the Red Army have been as unusual as they are commendable. The successful result of this evolution can only be fairly measured against the fact that the Germans also were constantly seeking, by adaptations and developments of their original methods to ensure in 1942 the decisive victory which had eluded them the year before.

The new principles of defensive warfare governing Russian tactics when the great Axis offensive was launched in July, 1942, may be briefly summarized thus. Defensive works must be built in great depth, artillery, antitank guns, minefields, and machine-gun nests should be deeply staggered so as to entangle the thrusts of enemy tank wedges as if in a net, and cause them to break up and become dispersed. However, since even the closest and deepest web of defenses may be ruptured at some point or other by the powerful blows of highly mobile forces, large reserves must be kept in hand for swift and heavy counterstrokes, even if the garrisons of the posts in the defensive zone have to be reduced somewhat to permit of this. The main thing is not to weaken their power of antitank defense, for it is of vital importance to limit the extent of any hostile breakthrough. As the flanks of any enemy wedge which have thus penetrated will be its most vulnera-

ble points, the defense posts on its flanks must hold on, so as to serve as starting points for a counter-thrust, aimed at cutting off the wedge at its base. The way in which this "cutting off the wedge at its base" can be achieved is normally to let its head, formed by the tank column, go by, and then to strike at the motorized infantry following up to consolidate the ground gained, employing for this purpose first fire and then counterattack. Thus the breakthrough on a narrow front, so much favored by the latest German offensive methods, could be turned into a fire trap for the attackers, leaving their flanks exposed to artillery and rifle fire, and then to blows by the infantry and tanks of the defense.

The important role of the defensive stronghold is that it enables the attack to be canalized, braked, and diverted. The use by the Axis of large masses of tanks, aircraft, and mobile infantry was designed to restore full mobility to the offensive. The general adoption of systems of defense made up of posts and centers of resistance was the Russian answer to these tactics. In this way, fire power could be developed into its maximum, while man power could be economized for the benefit of the counterattack formations. These posts and centers could hold out for a considerable time, even after they had been bypassed or outflanked by the penetration of the armored spearheads of the attacks. Therefore, they could not be neglected, and the assailants must divert troops first to mask and eventually to reduce them. They are usually sited at important inhabited centers, road junctions, or tactical points, and consist of a number of machine-gun nests and artillery positions well protected against shell fire or tank attack, each one flanking with its fire the approaches to those on either side of it, and capable of all-round defense. The center of resistance comprises a ganglion of such small posts, in close inter-communication and tactical relation with each other, and sited at intervals within effective machine-gun and rifle range. The garrison of each center may be anything from a battalion to a regiment (three battalions) of infantry, sometimes with a few heavy tanks added.

The necessity of dealing with these centers of resistance has the effect of breaking up and dispersing the forces of the attackers, which are thus thinned out long before they can capture the whole of such a defense system or attain any far-distant objectives.

It goes without saying that these tactics can be successfully applied only by highly trained and intelligent troops, such as those of the present Red Army, which has added to the traditional stubbornness, imperturbability, and endurance characteristic of its forefathers, these new qualities equally necessary for victory under the stress of modern warfare. With the aid of these martial virtues, and of the new methods of tactics thus devised and applied, the Red Army was able, within a few weeks of the opening of the great Axis summer offensive of 1942, to

reduce the hostile attempt at a breakthrough with far distant strategic objectives to battles of attrition for short-range tactical aims.

Tank Action at Night

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Lieutenant Colonel of the Guard N. Dushak, Soviet Army, in *Krasnaya Zvezda* 24 April 1943.]

THE COMBAT activity of tank units is very varied. They are able to decide complex problems of an offensive character not only by day but also by night. Practice has shown that night attacks by tanks have the greatest effect when the enemy has not yet succeeded in organizing strong all-around defense. Sometimes a sudden and powerful thrust by tanks easily crushes the hostile defense even at its strongest point.

On a certain sector of the front the Germans had just seized a village at an important junction of unpaved roads. In a few hours they moved up a fairly strong force of infantry, artillery, and tanks. In addition, our reconnaissance noticed other enemy tanks and infantry units on the approach to the settlement. It was clear that the Germans were intending to start an attack from this point and to develop it to a great depth. To frustrate the hostile intention, our tanks, after an intensive artillery preparation, attacked the inhabited place before evening. Serious damage was inflicted on the enemy, but he was not driven from the positions he had captured. Then it was decided to repeat the tank attack at night.

Taking advantage of gullies and ravines, the tanks were secretly concentrated not far from the village. Before the start of the attack, terrain reconnaissance was carried on and combat routes marked out, and, what was especially important, the tankmen studied with extreme care their orienting points visible in the dark. Each tank platoon and company was shown on the map and on the terrain the parts of the village and the streets from which the various units were to drive the enemy. Such precautions forestalled any confusion in the night activities of the tanks. As a rule, combat routes of tank units at night should be in straight lines, and each group of tanks should have a strictly limited field of action. It is desirable to start the attack itself late in the night, when the watchfulness of the enemy patrols is naturally lessened.

After midnight the tanks moved at high speed toward the inhabited place, firing their cannons and machine guns intensively. Breaking into the village, they unloaded groups of tommy gunners who immediately engaged the enemy. The blow was so sudden and powerful that in less than an hour the

village was cleared of Germans. During the short but fierce fight as many as 350 hostile soldiers and officers were killed; 11 tanks, 4 guns, and many staff and transport vehicles were burned or disabled.

Just as successful were the night battles of tanks on a number of other sectors of the front. Their success depended entirely on how well the organization of the attack was conceived, particularly the combat formation of the tanks and of the infantry they supported. In cases such as the one described above it is most useful to deploy the tanks in a line at increasing intervals. Then the effectiveness of hostile artillery fire is insignificant. As the battles were primarily for the possession of inhabited places, each tank carried a load of tommy gunners whose task was always to accompany the tank, never becoming separated from it. When the tank was forced to stop, part of the group was to take up all-around defense and with the aid of the vehicle to repulse enemy counterattacks. Infantry had to move at night directly behind the attacking tanks, and not break out ahead.

The command of tank night battles was carried out by means of colored rockets. Each tank unit periodically indicated its course of movement by rockets of its own assigned color; a special signal announced the arrival at the position which was to be occupied. Thanks to this, the senior tank commander was always aware of the course of events.

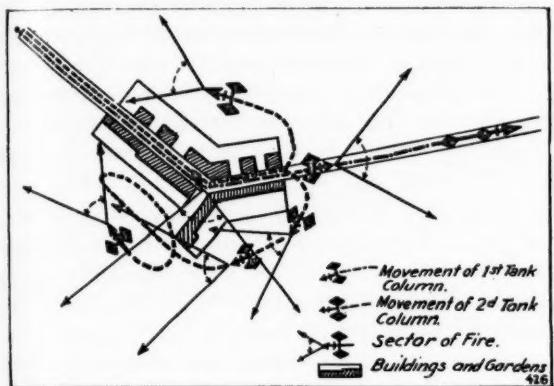
The choice of type of fire has great importance in night fighting. Experience has shown that fire on point targets and gun flashes is not very effective. As a rule, while the vehicles are on the move, it is necessary to use massed area fire. It is necessary literally to spray the enemy with shells and bullets, for such a fire soon deprives him of the will to resist.

Thus far we have spoken of night attacks accomplished in a brief time. Attacks are of a somewhat different nature when the mechanized units and groups are active in the tactical depth of the enemy positions. Psychologically upset by preceding failures and lacking solid defensive lines, the enemy is extremely sensitive at this time to bold night thrusts by tanks. Rapid night marches combined with lightning attacks sometimes permit the attainment of extremely important results. In this connection, the following example is instructive.

It became known that in a certain village far from the combat area the enemy was concentrating large forces. It was decided to inflict a blow on the hostile concentration preventing it from reaching the front line. Having accomplished a long march, two groups of our tanks broke into the village occupied by the enemy (see sketch).

The first column of tanks rushed through the village at high speed without firing and moved farther along the highway, sweeping away the enemy units encountered. Meanwhile the second wave of tanks

and motorized infantry broke into the village with headlights aglow. Part of them, passing through the village, turned and moved through the gardens, surrounding the enemy on both sides. As the tanks moved along the streets they opened fire on German guns, automotive equipment, and field trains. Confused and surprised, the Germans rushed out of the



houses in panic and fled to the fields, but here they were caught by the tanks with headlights turned on and were mowed down by machine-gun fire and crushed under the treads. The dozens of burning German vehicles and the dazzling rays of the headlights sweeping through the air and over the snow still further increased the panic in the enemy camp.

Soon the village was completely cleared of Germans. Having lost all his combat matériel, the enemy took to the woods in small groups. In the morning more than 600 dead enemy soldiers and officers were counted on the streets and in the gardens, and the German concentration was disrupted and partly dissipated.

The success of this night attack had depended largely on the suddenness of the blow. The Germans here were far from the combat area and did not expect the appearance of our tanks. The clever maneuver used by our tanks had a great influence on the outcome of the fight. Knowing beforehand that there were many Germans in the village, they still took a chance and attacked in a column, and this was tactically wise. If the tanks had deployed before reaching the village the Germans would at once have sensed the impending danger and would have taken appropriate measures.

The command of the tank unit acted correctly in breaking into the village in two tank waves (columns), the first column, passing through the village, became a sort of armored roller which crushed and dispersed the hostile units coming up to the rescue. The second group of tanks employed a double encirclement of the village thereby paralyzing the enemy movements.

In this nocturnal tank battle the destruction of a large German groupment was thus attained. For the solution of such a task by day, it is obvious that far larger forces would have been necessary.

Germany's Atlantic Bases

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Herbert Sprang, war reporter, in *Völkischer Beobachter* 18 and 19 April 1943.]

TRULY DECISIVE was the obtaining of the bases on the Atlantic for the conduct of our submarine warfare. From the dead angle of the North Sea such a world-wide war by our U-boats was never possible. Only with possession of the Atlantic bases which fulfill their tasks admirably could the far-reaching operations of the U-boats be planned and carried out with increasing success.

The most important task of a base is to provide a good and safe point of departure and assembly for all naval operations. To be sure, the German submarines—we must consider the tasks of the bases primarily from their point of view—have become much less dependent on bases. Technical innovations and improvements of all sorts have considerably increased their range of action and made it possible for them to stay at sea for weeks and months. And yet it is important that the routes through the north Atlantic or the Arctic can be attacked by a sudden thrust from the northern harbors, and that the routes across the middle Atlantic and between Africa and South America can be attacked just as swiftly from the Atlantic harbors of southern France.

Every base of operations must be protected. Vessels returning home from long operations in the open sea must not be exposed at the gates of their bases to dangers with which they themselves cannot cope. Even in the area of the coastal foreground, each ship becomes the object of protection of its strong point. Mine-sweeping formations of the German Navy clear the routes to the Atlantic of mines laid by mine planting aircraft or hostile naval forces, and thus insure safe departure and return. In addition there is the long-distance support by the air forces of the strong point. Submarine chasers comb the coastal foreground—the area of the ocean in front of a base—over and over for lurking enemy submarines. Small security vessels, outpost boats, blockade breakers, and harbor-protection boats move far out into the sea, there receive the returning ship or U-boat, and accompany it to its base.

Here at the base the ship or the U-boat now finds rest. For the first time in weeks the engines are silent and the men relax. It is a presupposition for every good base that a strong antiaircraft and a sufficient plane protection secures it and its floating units from attacks from the air. In order to give our most useful forces—our U-boats—absolute security, huge protective constructions—U-boat pens—have come into existence, which successfully resist the strongest effect of bombs and shells. In these pens our German submarines lie safe from all hos-

tile attack and are made ready for new assignments. Thus the *U-boat pens* have become the heart of our bases on the Atlantic.

Repair Facilities and Supply Bases

When the surface or undersea vessels have returned to their base from their world-wide battles on the seven seas, the base functions in its other spheres of activity. It must be both a satisfactory *repair harbor* and a suitable *supply base*. At sea each ship can undertake repairs of only a limited scope. The longer the stay at sea lasts, the more necessary is a thorough overhauling of ship and machinery. The heavier the wounds brought back from battle, the more energetically must the whole base pitch in to heal them. But if only a lack of fuel, shells or torpedoes, provisions or clothing forces the ships to return to the base, the supply must be ready in the harbor.

Ship repairs require *shipyards*. The bases on the Atlantic coast have at their disposal a wealth of shipyards in Norway, Denmark, Holland, Belgium, and France. Drydocks make possible the handling of ships for work on the hulls. The most modern lathes and machines insure irreproachable repair work. Hundreds of naval officers, construction officials, and engineers are at work to create and secure the facilities which distinguish the base as a repair harbor. Many thousands of German shipwrights work day and night with the greatest speed and German thoroughness to make every ship ready for battle again. The best of them, however, work in the special workshops of our U-boats. Here hammering and riveting, welding and milling, grinding and polishing go on untiringly.

When all damage is repaired and each surface or undersea vessel is completely overhauled and ready for service, the base must fully accomplish its task as *supply base*. This necessitates primarily a favorable position of the base in the general European transportational network. This situation is realized almost everywhere. Wherever necessary, new routes have been opened. From all parts of Greater Germany supply thus flows to the bases on the Atlantic and here awaits its use by the fighting units. Here fuel oil rolls up in seemingly endless fuel-tank trains. There a tanker, conducted safely from harbor to harbor through the coastal waters, brings gas. There barges carry kegs of grease. Everything disappears in the *fuel bunkers* which are installed somewhere in the base, invisible and safe from the effect of bombs. What supply has to accomplish may be seen in the fact that a single battleship, for a fairly long undertaking against the enemy, must take on oil which can hardly be brought up by five giant oil supply trains.

Then there is the endless string of provisions which must flow toward the ships. In the naval provisions warehouses installed in the bases the best

materials rise up in mountains, for nothing but the best is good enough for the U-boat crews. Supplies must always be ready in the bases, administered by careful and skilful hands, so that they can be taken aboard at the necessary time. The supply of ammunition and torpedoes also must not be interrupted. With regard to this last item the requirement on the front is enormous. To be sure, the homeland always builds more torpedoes than the men in the boats can fire. And this is good. But their transport and storage often cause problems for the base commander which are not easy to solve. Finally, the necessary equipment for the crew must be kept ready in large naval depots.

In all this the greatest economy is necessary. It is not possible, for instance, to store leather packs for speed-boat crews far in advance, when no speed boats are expected at the base for a long time. The packs are then certainly needed more urgently at other places. But if speedboats are brought into the base, the packs must be on hand at once. On the other hand the base commander cannot store an engine part which is found only in Germany, just keeping it ready for an emergency in which a ship might sometime need it. But if a unit orders this engine part from far out at sea it must be on the pier at the latest on the day the vessel docks. To accept all these thousands of worries as to the supply of the ships, to furnish everything they need, and to equip them well and make them ready for action again as soon as possible, this is the most gratifying task devolving upon the officers and men of the base.

Bases As Sources of Strength

One other mission of the base should be mentioned. Only a person who has been out at sea for weeks can understand the affectionate memories which each sailor cherishes concerning "his" base. Usually he comes back repeatedly to the same base. Then for weeks after the departure conversations in the officers' mess and men's quarters revolve about the incidents and personalities directly connected with their base. This base has long ago become a second wartime home for our blue-clad youth. Leave for their real home is rare, and the source of strength flowing in the letters from home is not always enough. So here too the base must act, storing up valuable reserves of strength in the men which they expend later in battle.

U-boat sailors in particular realize the value of seemingly unimportant things. The first friendly greeting makes a great impression, the first friendly words he has heard for weeks outside the circle of comrades in the boat make him happy. Then comes one thing after another: the clean room with its large windows where he now lives, the white-covered bed, the tablecloth, the flowers awaiting him, arranged for him alone, the comfortable living room which, with its furniture, pictures, and books, is a

small piece of Germany. Then follows the meeting and friendship with one or another of the German girls working in the shipyard or in the communications service. In the summer the environs invite sport and games, in the winter the homeland sends excellent movies and its best artists.

All this should not be underestimated, and the wise base commander, correctly appraising these things, sees his finest and most honored task in precisely this activity. Not only the ships, not only the boats are rested, repaired, and equipped at the base. In the final analysis it is always *the man* who fights, and a base which does not refresh the warrior, sending him forth inwardly strengthened and enriched to his weeks-long solitary battle, has not accomplished the admittedly nonmaterial task expected of it by everyone familiar with conditions. That our bases on the Atlantic compete with one another in care of the fighters on the oceans of the world is a matter of course.

In the Defense System of the Atlantic Wall

Thus, numerous bases on the Atlantic from the far north to the south today fulfill their task of being strategic points of departure, repair harbors, supply bases, and sources of strength. We understand the favorableness of the resultant strategic situation, we know for certain that only from here, only with support on the broad Atlantic, is a naval warfare leading to final success possible. That our enemy also realizes it is beyond doubt. British sea power has always had an exceptionally fine feeling for whether or not a point on some coast possessed value. England knows today that, as a result of the German U-boat war, it can no longer be master on the seas. It has fought against the U-boats more than three years without success. On the contrary, the figures on sinkings keep on rising. We know that the bases on the Atlantic are painful to the British and are their most important object of attack. Therefore they have become for us the most important objects of defense. In the bases and around them the defensive wall on the Atlantic grows to gigantic proportions. The German Navy itself has taken up the protection of the bases from the sea. The Atlantic Wall begins far out on the water. There the chain of *outpost boats* lies on the lonely expanse of the sea. In constant combat with hostile bombers and speedboats, the outpost boats daily fulfill their duty. Nobody can approach without being reported, without the defense preparations of the whole coast having been promptly notified. Behind the outpost boats stand the *harbor-protection* boats at their positions, entrusted with the same tasks but closer to the coast. Behind them a powerful net blocks off the harbor hermetically. In the whole foreground minefields make the approach of hostile naval forces dangerous. On the coast itself stand heavy and super-heavy batteries under whose combined fire every attempted attack by enemy units

must collapse. Finally, naval and air service anti-aircraft around the base secure their objects of protection against aerial attack. Thus the naval commander and the leader of the security division are able to carry out the protection of the base and the neighboring coastal foreground, and defend the ocean front from attack by sea.

In the construction of the Atlantic Wall, which more and more is developing into the greatest defensive wall of all times and exceeds the West Wall in strength and depth, these bases were included in the defense system. Important estuaries, with their harbors and the U-boat bases, are additionally protected by huge, newly constructed battery positions, deeply echeloned and strongly reinforced with concrete. Within the area of the bases themselves, however, stand the soldiers of the navy, of the army, and of the air force, shoulder to shoulder with their comrades of the Todt Organization, at once workers and soldiers in the best sense of the words. The experiences accumulated in the street and house-fighting in the struggle in the east are exploited. An invading enemy would have to fight for every building, for every block, for every object, against our soldiers who know the importance of their task and will not yield an inch.

Thus, every base is ready for defense against attacks from the sea, from the air, and contrary to expectation even by an enemy invading by land. Around and near the base the nests of resistance extend along the whole broad Atlantic front, from one important base to the next. Every small bay, the smallest harbor, every stretch of coast which seems in any way vulnerable, is occupied by such nests of resistance.

Close together, with intersecting areas of fire, they extend along the whole Atlantic front with their rapid-fire guns, light and heavy machine guns, mortars and flame-throwers, and minefields. Behind them stand the batteries of the army; between them, at accurately determined and calculated intervals, the heavy coastal batteries. All weapons have been tested and adjusted to the last detail. And then, far behind this deeply echeloned curtain, wait the reserves of the higher command, the tank troops and the elite infantry forces, to throw back any enemy who might somehow invade.

No, they will not get through. For even in the lonely sentry, who does his duty at the extensive barbed-wire entanglement somewhere on the front thousands of kilometers in length, there is not only the will to most resolute defense; in him the spirit of attack is always alive, the spirit that has borne him up in three years of war, and the consciousness that he is helping to keep the hilt of the sword in the hand of the command, a sword which with biting sharpness, lightning speed, and deadly sureness is striking everywhere on the breadth of the seven seas and bringing the enemy to defeat.

Attack on the Flanks

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from an article by Lieutenant Colonel of the Guard A. Aslanov, Soviet Army, in *Pravda* 27 December 1942.]

SOVIET TANKS possess high maneuverability and great striking power. In close cooperation with infantry and artillery they can execute any tasks in the annihilation of enemy personnel and matériel. Maneuver on the field of combat plays a great role in the achieving of success. I always give preference to a thrust on the enemy flanks, not to frontal attack, however tempting it may be. To seek out the enemy's flanks and to strike him in the most vulnerable spots is not a simple matter; it requires of every officer a great deal of work, ingenuity, and endurance. Let us demonstrate this by a few examples.

On the first day of offensive operations our units accomplished a breakthrough of the enemy's defense. My unit was attached to a certain infantry force. On the eve of the operation we conducted careful reconnaissance of the locality, studied in detail the system of hostile defense, and determined its weak places and the junction points between units. The tank commanders worked out plans for close cooperation with the infantry and artillery commanders.

At night, unobserved by the enemy, the minefields were explored and cleared; passages through them were indicated with markers and white ribbons. Besides this, each platoon had a sapper attached as guide to accompany the tanks.

Besides the 45-mm guns of the direct tank support functioning in our combat formations, 76-mm guns located on the flanks contributed to the silencing of hostile antitank defense. In the combat formations of the infantry, passages were left for movement of horse-drawn MG carts. For our approach toward the enemy and his encirclement from the flank, we took advantage of the irregularities of the terrain, negotiating open spaces at high speeds.

The battle developed in the following manner: The hostile antitank defense was crushed at the very start by our artillery. The tanks had already succeeded in negotiating a large part of the distance from the line of departure to the forward edge of the enemy defense and were proceeding into the flank of the hostile dugouts. When the Hitlerites turned their surviving guns and began to fire on the tanks, our light guns, which followed the tanks very closely, fired point blank on the enemy gun emplacements.

Under the protection of the light guns, the tanks deployed for the flank attack and advanced along the line of hostile infantry groups. With their fire from all types of weapons and with their treads,

the tanks annihilated enemy personnel and smashed their dugouts. The battery of 76-mm guns, having moved to the heights captured by us, furnished protection from enemy counterattacks. Part of the infantry, which had come up hurriedly, consolidated the position, while other units at the same time pursued the fleeing Hitlerites. A few minutes after our machines left the starting position for the attack, they had broken into the rear of hostile defense. We had not been delayed in any way. To a considerable degree the excellent communications had contributed to this success.

If flank attacks have such great significance in combat with hostile infantry and artillery, their importance increases still more in encounters with hostile tanks. The problem consists in forcing the enemy to fight under conditions which are not favorable to him. It is well known that the side armor of German vehicles is considerably weaker than the rear armor. Hence it is necessary to force the Hitlerites to present their vulnerable spots to us.

Several days ago our units were fighting fiercely with counterattacking German tanks. The hostile tanks succeeded in wedging themselves in on the combat formations of our infantry. Our unit received the mission of counterattacking the Germans and of encircling and annihilating them. One unit cut off the German tanks by attacking from the east. Catching sight of our machines, the Fascists wanted to hit their flank, but the enemy did not take into account one thing: the flank of the unit attacking from the east was covered by my tanks, which stood in a small gully awaiting battle. The German tanks at one point crossed the combat formations of our infantry and started to climb the height directly in front of me. The Fascists could not see my machines, because they were well camouflaged and were moved close to the banks of the gully, but all the German tanks were in perfectly plain view from our position.

We were in no hurry to open fire. The important thing was not simply to forestall the enemy's flank attack, but to inflict the greatest damage possible on him. Up to fifty German tanks in single file stretched up onto the height. When they had already begun to move down into the gully and were only 80 to 100 meters from us, I ordered volley fire. Immediately several German machines burst into flames. Recovering after the first blow, the Germans discovered us and began to deploy on the height in order to proceed to attack. I foresaw the intention of the enemy and at once sent the company of Guard Lieutenant Tolstov on a flanking movement to the right. When the Fascists came at us, Tolstov counterattacked them from the flank. The Germans rushed about, but whichever way they turned they came under flanking fire.

Attacks followed one after another. The enemy lost seventeen tanks and fled from the battlefield.

Thus the German tanks fell into the very trap they had prepared for us.

To strike the Germans on the flank—that is my basic principle in combat. These tactics get results for the unit which I command. My subordinates have learned these tactics well and use them with success.

Attack on a German Center of Resistance

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Major B. Korol, Soviet Army, in *Krasnaya Zvezda* 10 June 1943.]

AMONG the combat encounters occurring recently on one sector of the front, special attention should be paid to an attack conducted by two battalions with complete success. A short description of the positions occupied by the Germans and by our troops will show why the attack was undertaken.

The forward edge of the German defense ran along the edge of a wood from which the disposition of our units was observable to a depth of more than three miles. The Germans laid down observed artillery fire on a macadamized road which, as a result, became unsuitable for movement of our supplies. The hostile artillery covered by its fire many of the roads leading from our rear to the forward edge of our position. Besides that, the position occupied by the Germans could be used by them for attack on a certain important objective.

The forward edge of our defense was situated in a locality unfavorable in every particular. Our observers could not see even the advance positions of the enemy except at a few points where our forward edge was only 20 to 30 meters from that of the Germans.

In front of their forward edge, the Germans had laid out a dense minefield eight to ten meters in depth and had built barbed-wire entanglements. There was also a log barricade which served the enemy both as cover and as an anti-infantry obstacle. Behind the barricade were machine-gun nests and tommy-gun and infantry positions. Then came barbed-wire entanglements, behind which were located artillery and machine-gun emplacements of log and earth construction. Here also were mud huts adapted to all-around defense. Such was the first line of enemy defense installations. The second, at a distance of 150 to 200 meters, was similar to the first.

According to the reconnaissance data, the Germans had a powerful fire system organized in depth. It was assumed that they could bring into action about twenty-six artillery and mortar batteries to repel an attack. This factor, of course, was most vital in evaluating the situation.

It was necessary for the attack to attain surprise, which would forestall the enemy's artillery fire

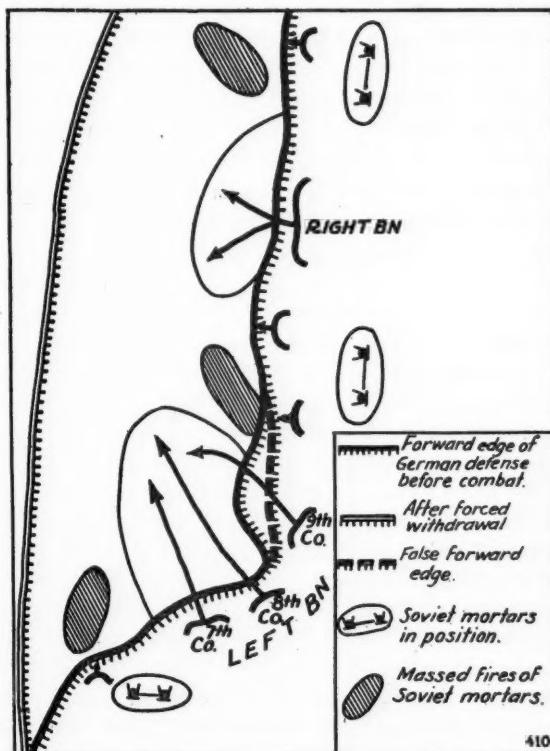
while our companies were breaking in on the forward edge. It was also important to mislead the Germans concerning the direction of our thrusts and thus force them to disperse their artillery and mortar fire. Finally, it was necessary to overwhelm the forward edge as rapidly as possible and break through into the rear, escaping the destructive artillery fire which the enemy usually brought to bear on attacking units when they became stalled in the positions of the forward edge.

How was the attack prepared?

First of all, the sappers, working at night, accomplished their task. In order not to arouse any suspicions, they simply neutralized the German mines but did not remove them. Under the wire entanglements they placed Bangalore torpedoes to blast passages at the very moment of the attack.

At the same time new roads were prepared. Thus, on the left flank, the troops extended a road concealed by the high bank of a river, and along this road they succeeded, without being observed, in moving up to the forward edge regimental guns whose positions had been prepared beforehand.

The formation of the infantry concentration for attack deserves attention. On the right flank the concentration extended along the foremost trenches of our defense. To bring up a whole battalion here in



such a way as not to attract the enemy's attention was possible only with absolutely silent movement. For this reason the battalion moved by platoons with the greatest caution. On the left flank, where the distance from the German positions was greater, the

MILITARY REVIEW

line of attack was designated at 70 to 100 meters from the enemy. The terrain here was quite open, and for this reason it was still more difficult to make a concealed concentration. The battalion engaged here moved up with its combat formation echeloned to the right in a staggered formation. At first, two companies (the 7th and 8th) went up to the forward edge of our position while the third (the 9th) was disposed in staggered echelon to the rear. Then, when the two companies proceeded to the line of attack in platoons, the third moved up to our forward edge.

Now let us consider the battle. Before dawn, all guns in open and hidden positions, and also mortars, fired a simultaneous volley against the German forward edge. Each gun fired strictly on a previously determined target. It should be noted that this was really a volley, not a sustained fire attack, and it served as a signal for the attack. The artillery at once shifted its fire to the enemy rear and our infantry rushed through the passages cleared in the German minefields.

The thrust was delivered at two places, to right and left, in convergent directions. One battalion was engaged in each direction. Between them and on the outer flanks, small groups of our infantry were active with the task of creating the impression that the attack was being executed on a broad front of almost four miles. These small groups went into action at the same time as the battalions.

At first the Germans were totally disconcerted. Complete surprise was attained, and the enemy did not know where the main blow was being delivered. The Germans' confusion was attested by the fact that they opened artillery fire only after the attack had been going on twenty-four minutes.

The attack developed unevenly. Its greatest success was on the left flank where the 7th and 8th Companies, rushing forward directly as the volley was fired, overcame the obstacles, and broke into the German positions. The battalion commander at once committed the 9th Company also. The first two companies quickly destroyed the German firing points in front of the dugouts. Then the resistance of the enemy in the dugouts was crushed. At this time it became apparent that the forward edge of hostile defense on this sector was laid out differently from what had been supposed. The line of dugouts abruptly curved back into the rear (see sketch). In the right-hand sector, therefore, false positions of the forward edge had been arranged. The 7th and 8th Companies moved straight forward and were exposed to fire from the right flank. Then the 9th Company, moving in staggered echelon from the right, outflanked the German dugouts on the real forward edge.

Having accompanying artillery in its combat formation and aided by the fire of supporting artillery, the battalion destroyed a number of enemy installa-

tions in the depth of the German defense and crushed dozens of firing points. It moved some 400 to 500 meters forward, overcoming two lines of hostile defense. Here it received the order to consolidate. Prepared mine and wire obstacles were carried forward at once, and the battalion encircled itself with them. At this time it was already subjected to strong enemy artillery fire.

The right-flank battalion had somewhat less success. It succeeded in overcoming only the first line of enemy defense. This battalion stopped in positions well covered by the Germans' registered fire and was subjected to the action of extremely fierce enemy artillery fire. Of some significance also was the fact that the soldiers who got past the obstacles in this sector unexpectedly found themselves in a ditch filled with water.

However, on the whole, our success was considerable. The following situation developed. In two sectors of the German defense center held by a regiment, two of our battalions were wedged in, and the distance between the points of the wedges was not great. The enemy was in a deep pocket. Confronting him was this alternative: either he might withdraw the units from the pocket, or he might undertake decisive measures to restore the situation. The Germans, not wishing to lose entirely their advantageous positions, chose the latter course. For three days the enemy counterattacked with forces from a platoon to a battalion. Each time a prolonged artillery bombardment preceded the counterattack. For instance, the artillery bombardments once lasted three and a half hours. The enemy brought into action more batteries than the command of our units had anticipated.

But the Germans attained nothing. On the flanks of both our battalions, groups were active which had the special assignment of defeating enemy counterattacks. The previously registered fire of attached mortars had decisive importance. Large groups of mortars had been placed in position ahead of time against the enemy flanking counterattacks. The right-hand and center groups consisted of thirty-six mortars, the left-hand groups numbered more than ten mortars.

The first efforts of the Germans failed to cut off our wedges at their bases and as a result all further enemy counterattacks were frontal. They were exceptionally fierce and were supported by furious artillery and mortar fire, but our battalions did not yield even a meter of captured soil.

At the end of the third day the strength of the enemy ran out. Having lost a whole regiment here, and a dismounted motorcycle battalion in addition, the Germans ceased counterattacking. From that moment began the enemy's gradual drifting out from their position in the pocket we had formed. Our battalions destroyed hostile dugouts with methodical artillery fire. Besides that, our small

groups operated actively. The Germans maintained themselves in the pocket for about two weeks, but finally they were forced to withdraw from the whole area they had formerly occupied. Our unit had completely fulfilled its task.

What are the general conclusions? The described attack shows once again that offensive combat must not be conducted in a stereotyped fashion. When circumstances demand, it is possible to dispense not only with artillery preparation but even with fire attack, chief reliance being placed on artillery support of the infantry in the course of the attack, especially at the time of fighting in the enemy rear.

Once again it was proved that partial attack brings success only after careful preparation, which permits avoidance of fruitless repeated attacks. The great importance of absolute secrecy is emphasized; the attacking unit managed to keep this secrecy perfectly. Preparations went on for three days in a completely open terrain, and the enemy suspected nothing.

The great significance of advance measures for the consolidation of captured positions and for the defeat of flanking enemy counterattacks was demonstrated. Here it is especially important to mention the massed use of mortars. Their fire permitted the isolation of hostile centers of resistance on the flanks of our attacking battalions.

It is very clearly evident from the experiences of this attack how important a sober estimation of artillery capabilities is—both those of the enemy, and one's own. To estimate the relationship between them is especially vital in a partial attack, when the enemy has the possibility of calling for all the artillery of his neighboring sectors and concentrating its combined fire on a narrow front, maneuvering his artillery fire from target to target.

Finally, this battle emphasizes the principal element, i.e. the role of the morale factor. Bold and decisive movement forward on the left flank quickly overwhelmed the strong enemy defense and avoided the destructive fire of enemy artillery from the initial moments of the attack. Less decisive actions on the right flank caused our companies here to suffer greater losses. The heroic actions of both battalions in clinging to the seized areas bear witness to the fact that in all circumstances stubbornness is the prime condition for success. In defense the deciding factor is, first of all, firmness—readiness to die rather than give up the captured positions. Our battalions beat off twenty-one enemy counterattacks and stood up under a hurricane of artillery fire.

The Army Pigeon

[From an article by Frank W. Lane in *The Royal Air Force Quarterly* December 1942.]

THE USE of the pigeon as a message carrier in war

goes back a long way. Pigeons were used as couriers in the armies of the ancient Greeks and Persians. Brutus, besieged by Antony, dispatched a message by a pigeon to Octavius asking for reinforcements. The Royal Signal Corps of Julius Caesar was composed of homers. The Turks used pigeons by the thousand during the Crusades. The Dutch made use of them in the wars of the Netherlands, and William the Silent sent clouds of them up during the siege of Haarlem.

But in 1908, when the field telephone was adopted, the British War Office dismissed the pigeons as out-of-date. 1914 showed the folly of such dismissal. By the time of the Armistice we had a pigeon-force of some 20,000 birds. But Germany started World War I with that number of trained pigeons.

To develop and improve the pigeon's natural homing instinct and flying powers has been the aim of fanciers for generations. But within recent years, and especially since war has given an added impetus to the study, revolutionary progress has been made in pigeon science.

It is not so many years ago that a sustained homing flight of 200 miles in a day and a mile-a-minute clip were considered outstanding performances by any pigeon. Now, 500-mile-a-day trips and bursts at over 70 miles per hour are common among the best pigeons.

A first-class racing pigeon, going all out, is one of the speediest things in nature. Occasionally its passage through the air produces a rushing noise like the sound of escaping steam. Collisions between pigeons in mid-air sometimes have fatal results. I understand that the highest speed ever maintained by a pigeon over a long distance was 93 miles per hour for eighty miles. But I think it is fair inference that for all such exceptional records the pigeon was getting considerable help from the wind.

The modern training of pigeons has not stopped at improving their natural capabilities—new flying qualities altogether, of great importance to message-carrying in wartime, have been bred in a few selected strains. Intensive work has been carried on at the lofts of the U. S. Army Signal Corps at Fort Monmouth, New Jersey, and it is chiefly the results achieved there that I am outlining in what follows. It may well be, of course, that our own Signal Corps have a few pigeon wrinkles of their own but obviously our results are not being publicized for the benefit of the German pigeoneers.

A normal homing-pigeon will fly from dawn to dusk and then, if away from home, will seek out a convenient tree and bivouac. But in a war that bird may be carrying a message upon whose prompt delivery may hang the lives of thousands of men. Within recent years it has therefore become an aim of utmost importance among pigeoneers to develop a strain of night flyers—and they have succeeded!

MILITARY REVIEW

At first pigeons were noted which flew earlier in the morning and later in the evening than other birds. These birds, which had a tendency to fly in dim light, were chosen for breeding stock.

The squeakers from this brood were trained at dawn. Gradually the start of the training period was set earlier until the pigeons were flying in absolute darkness. At the beginning the birds used to wheel and circle in uncertainty, but usually they stayed in the air. As soon as they could see anything at all they were off to their destination. Eventually the birds could make their way home in complete darkness.

To aid the birds to land blue lights were placed on their lofts. So well have these night-fliers been trained that at the end of the course one batch covered fourteen miles in eighteen minutes through darkness.

One of the trainers commented: "Yes, it's against pigeon nature. Their instinct is to come down when it gets dark. What we do is teach them self-confidence. They can fly at night. We simply prove to them that they can. Once they have self-confidence there's nothing to it... The night fliers, of course, don't do any day flying. They've just got that one job. They're specialists."

Hardly less important from a military point of view than a message carrier that will not call it a day at nightfall is a bird that will fly back from its objective with an answer. And to meet this desideratum the pigeoneers have evolved a breed of two-way pigeons.

At Fort Monmouth a true blue-blooded pigeon named Mister Corrigan was taken, whose ancestry was known for 525 pigeon years of life. 167 famous champion racing pigeons appeared in his pedigree, including the names of some famed army message carriers.

On such aristocratic material Major John K. Shawvan, of the U. S. Signal Corps, set to work. A short while ago it was announced that under the Major's tutelage Mister Corrigan had made pigeon history. He flew twelve miles from his home loft to a small container around which crouched a small group of soldiers. Five minutes later this history making pigeon was winging his way back on the return trip to the loft he had left not many minutes before.

Today Fort Monmouth claims to have a flock of nearly a hundred of the only two-way homing pigeons in the world—birds able to carry messages on round trips across battlefields.

Just how these birds were trained is a closely guarded military secret. Some indication of the methods adopted, however, may be gained from some French experiments which were carried out in the last war in an attempt to evolve a two-way pigeon.

In these tests a pigeon which was rearing young was taught to fly to a distant loft for food, carrying a message at the same time. When the pigeon had fed

it returned to its own loft to feed its young (pigeons feed their young on "pigeon's milk" which is produced in the crop of both sexes) and brought back a message at the same time.

These early two-way pigeons proved useful in some instances in keeping up communications between forward trenches and the rear. But as pigeons trained by such methods were effective over limited distances only, it may well be that the pigeons bred at Fort Monmouth by the U. S. Signal Corps have been trained by ways as revolutionary as their success has been complete.

But even with two-way night-fliers the needs of the Signal Corps will not be quite complete so the experts have had once again to start experimenting. This time it was to produce a bird that would return to its base even if it were moved after the bird had left.

The military need for such a pigeon is obvious to anyone who has studied the tactics of *blitzkrieg*. In this method of warfare a breakthrough by panzers may cause headquarters, i.e., the birds' home loft, to move hastily to the rear. And in such an eventuality messages sent back by hard-pressed forward troops could never be entrusted to an army pigeon trained on World War I standards.

The modern army pigeon, like every other unit, is therefore being trained on the *blitzkrieg* model. As the essence of this type of warfare is mobility, pigeons are now being accustomed to home to mobile lofts. Here, in the words of an American army pigeoneer, who is engaged on training the "*blitzkrieg* pigeons," is how the birds are taught.

"The pigeons," he says, "are trained from the trailer. That's their home. That's where they live and that's where they are fed. From the first day of training we start them flying to the mobile loft. In time they learn to spot that loft as easily as they would the fixed loft. The lofts are specially painted. As pigeons have a well-developed color sense such painting aids them in returning."

"Then we move the trailer a little way. They are uncertain at first, but they come down to it and are rewarded. We move it again. Finally we move it quite a distance, and before we take them away for a flight we let them out for exercise. They circle up and look around, fly off in one direction, then in another, apparently getting their bearings. Then when we take them out several miles, and toss them, they go straight back to the mobile loft."

Such then are the up-to-the-minute streamlined pigeons which are at the disposal of the American (and British?) army of today. And when, in one bird, can be combined night-flying, two-way message carrying to movable bases, a weapon will have been forged which has been the dream of army commanders since the dawn of organized warfare.

The War Against Guerrilla Fighters

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Major Schäfer in *Hamburger Fremdenblatt*, Hamburg, Germany, 19 June 1943.]

This article brings out clearly the effectiveness of the Russian guerrilla bands ("bandits" or "partisans," as the Germans call them) who are described here as well organized, well trained with the aid of an official manual, amply armed, efficiently led, and centrally directed from Moscow. It must be pointed out, however, that such an article as this also has propaganda value in Germany, for by emphasizing the difficulties of the German army in Russia some justification is offered for its failure to knock out the Soviets.—THE EDITOR.

WHEN IN THE SPRING of 1942 the Soviet bands in the rear of the German front were either annihilated or scattered, a part of them saved themselves in inaccessible forest and marshy areas, extended the range of their activity, and received reinforcements from escaped prisoners or Soviet soldiers who had filtered through the front lines. Reinforcements also came in from the Soviet front by air—volunteers, drafted troops, and special troops of all sorts. And so there were gradually developed partisan groups organized in a military manner, directed by the main headquarters of the partisan movement at Moscow. From here, officers, commissars, and party members were sent out who attempted by their personal influence, by appeals to patriotism, or by the threat of retribution, to organize the band movement still better.

In the oath which the members give and are forced to confirm by their signatures, they bind themselves to unqualified discipline and to fight without regard for consequences. The text of one of these oaths closes with the words: "If, however, on account of weakness, cowardice, or bad will, I do not keep this oath, and commit treason toward the interest of the nation, then shall I die the death of an accursed person at the hands of my comrades. With this understanding I sign this."

The bands live on the region in which they are quartered. Supplies of arms and ammunition are obtained in many ways. Often they find matériel in those areas in which the great encirclement battles have been fought. Also, in their retreats, the Soviets, with the requirements of the partisan operations in mind, have buried light and heavy weapons and ammunition which are later appropriated again. Some of the bands obtain equipment by attacks on German supply trains or on German camps. A large part of their matériel, such as special weapons and special apparatus, is brought to them at night by the air

route. In this way they also receive motor fuel, medical supplies and dressings, and decorations. At night there is often heavy plane activity serving these bands alone, the planes either landing or dropping their loads from the air.

In one of Stalin's orders the statement was made: "The partisans, both men and women, must intensify the fight in the rear of the German occupational troops, destroy the enemy's means of communication and transportation, and annihilate his staffs and technical equipment, and never withhold a bullet against the oppressors of our fatherland." Hence they are to disturb and cripple the German supply columns on the way to the front, the traffic routes in the rear, and the communication system by means of all sorts of attacks and acts of sabotage. Thus it is their intention to create a continual state of unrest in the regions back of the front, tying up German forces which are forced to maintain a sharp watch against them.

Another mission assigned to these bands is that of causing confusion in the German lines by means of attacks from the rear, thereby facilitating the task of the Soviet forces approaching from the opposite direction. It has repeatedly been established that bands have attempted to break into the fighting in this manner, and further, that regular soldiers whose retreat is partially or wholly cut off have gone over to the bands in the forests. This accounts for the fact that several areas close to the front, even a short time after a mopping-up operation, have again been found infested with partisans.

Against those groups which desire to work with the Germans the partisans employ the most severe measures. Frequently, from their hiding places or the regions that they already have in their possession, they make sorties against communities that have not conformed to their desires, kill the mayor, his helpers, the members of local combat organizations [all these are German-appointed persons], and civilians who have dealings with the Germans and, after replenishing their own camp, they divide the stock and grain they have carried away with the inhabitants who either voluntarily or under compulsion have made common cause with them. By means of such reckless and malicious acts of violence, by the threat of punishment, and by means of anti-German, pro-Bolshevist propaganda, they attempt to undermine the people's trust in the German armed forces and organizations and thus win political influence.

The men of these bands are not soldiers, even though at times they are reinforced by regular troops. Their exterior appearance and dress marks them as bandits. As a rule they do not wear uniforms with insignia of rank, but civilian clothing of all gradations of colors: in other words, they are civilian outlaws. The most popular dress is that of the innocent men and women of the land. Many of them are fitted out with civilian clothes and some portion of a

uniform so that, in accordance with the dictates of the situation, they can change in a very short time. Bandits have even been encountered wearing German uniforms with the insignia of officers and enlisted men, while others wore two different uniforms, a German one under a Soviet Russian one in order to expedite the change from one to the other. Their equipment like their dress is extremely varied and diversified. In recent months many modern weapons of all sorts have been brought to the bandits by the air route. They have rifles with silencers, light and heavy machine guns, machine pistols, even antitank and antiaircraft guns, field guns, and a few tanks. Special weight has been attached to their provision with radio apparatus in order to secure a single command and central control of the bandit units, which are often widely separated.

The method of fighting of these bandits is particularly treacherous. They do not fight as regular soldiers but as bands of outlaws. Their usual methods of combat include acts of sabotage during the night against installations important to traffic (railroads, bridges, highways), industrial establishments (dairies, saw-mills, etc.), and storage depots of all kinds; also attacks from ambush on inhabited places, on strong points, on German units on the march that are numerically weaker, on motorized columns, and on solitary vehicles. They are extremely clever and versatile in their methods. When, for instance, during the volunteer evacuation of the region from Rzhev to Vyazma during March of this year, great lines of civilians were moving into the area to the rear, a band immediately appeared in the disguise of these traveling civilians. A manual intended for the use of the bands contains a very thorough treatment of all combat and sabotage methods and all means of transmitting information. These bandits avoid actual fighting. If they run into rather strong resistance, they break off the fight, disperse in the woods and assemble again in preconcerted places, or else drop out of sight temporarily as innocent civilians in the villages. If these plans fail, they fight desperately, stubbornly, and ferociously, because they know that they are going to lose their lives anyway. For the leaders, the last resource is often a bullet from their own guns. As a rule, they entrench their camps deeply in the forest, provide them with strong earth bunkers, and secure them with a mined zone as well as with barricades of branches and felled trees.

In all operations against the bands it is necessary that adequate forces, by the employment of surprise, effect an actual encirclement and elimination of the bandits, for the aim must be not to drive them off but to *annihilate* them. This, of course, is more easily said than done. With the excellent communication, messenger, and espionage system available to the bands in their own country, and especially with the volunteer or forced support of the civilian

population, they very quickly receive reports of troop movements that are not sufficiently concealed and this is always followed by an assembly of forces of major proportions. Afterward, they immediately beat a retreat so that a German operation begun under these conditions is not worth the effort and expense involved. If, however, a larger area controlled or infested by these bands can be surrounded by sufficient forces in a surprise operation and systematically combed, success is never wanting. The prerequisite is that the outer encircling lines be so dense that it is impossible from the very outset for large portions to slip through or break their way out. Then, sector after sector, the circle is drawn closer and the enemy is driven back against an artificially constructed barrier which may be reinforced by means of a natural obstacle such as a river. In these operations it is of decisive importance to force the bandits out of swampy, forested terrain into an open area.

Single, flexible command with a good and rapidly functioning communications system at its disposal is essential for the success of operations against the bands, and in all cases hard fighting on the part of the advancing troops is required.

After the manner of bandits, the partisans make use of all sorts of tricks. For instance they lie in little depressions and cover themselves with sod or moss and remain quite still under the protection of the green foliage. The observer for such a group sits in a tree with dense foliage. Any one who has seen the camps and hiding places of these bands in almost impassable country finds confirmation again of the fact often proved in the eastern campaign, that these men of nature and of the forest in their unbounded artlessness are endowed with instincts which the educated and civilized man no longer has at his disposal.

The Guard on the Island of Rhodes

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article in *Pariser Zeitung*, Paris, France, 28 April 1943.]

IN MEDITERRANEAN strategy, islands are of enormous significance. Situated in the angle between the coast of Syria and Palestine on the one hand, and the coast of Asia Minor and Turkey on the other, the island of Rhodes and the Dodecanese group of islands to which it belongs command the routes leading from the western Mediterranean to Asia Minor and the Levant. When one approaches the island of Rhodes by boat, it rises out of the cool, deep blue of the water with its walls, battlements, and towers like a vision of the Middle Ages. Today the island is the eastern outpost and corner pillar in the chain of islands

FOREIGN MILITARY DIGESTS

which, including Crete and Sicily, stretches all the way to Sardinia, protecting the Greek and Italian peninsulas.

In two sectors of the long Mediterranean front the English and Americans have assembled their land, air, and naval forces; first, around the Tunisian

support of the air forces. During the night, British naval units again approached the island for the purpose of taking the English landing party on board, but of the 500 English soldiers on the island a considerable part was compelled to remain behind, falling into the hands of the Italians. This defeat was



bridgehead, and secondly, on the Syrian coast and the island of Cyprus, the island opposite Rhodes, where they lie in wait. The British news agency, Reuters, states that "particularly strong British-American combat forces are on the island of Cyprus" ready for action.

The British made an attempt once during the course of the war to effect a landing on the Dodecanese. The place of the attempt was the island of Castelrosso, the thirteenth island of the group, but which geographically does not belong to the twelve islands designated as the Dodecanese. The landing took place shortly before the blitzkrieg of the Axis powers against Greece. At that time the Dodecanese group was an isolated Italian outpost. On the morning of 25 February 1941, under cover of fog, two English cruisers, two torpedo boats, and an auxiliary ship (a relatively large force) approached the little island whose area is only ten square kilometers. They succeeded in overpowering the occupants of the island who consisted of only a few soldiers and sailors. Shortly afterward an attack was begun by Italian air forces which compelled the English naval units to withdraw. Then speed boats and other light Italian units approached the roads of Castelrosso and landed a mixed detachment of sailors, soldiers, and black-shirts who attacked the English with the

the more embarrassing to the English since they had been proud of their accomplishments in this landing.

In recognition of its great strategic significance, Italy has given the little group of islands an adequate military organization. First of all it is suited for air defense. No Italian naval forces of any size have been sent to the Dodecanese, but light surface units, such as torpedo boats and units of the excellent speed-boat arm, have been sent there. The mission of these naval forces is defense. However, the mission of the Italian air forces on the island of Rhodes is attack. Their offensive flights extend clear to Alexandria and the Suez canal and at the present time the planes from the Dodecanese attack particularly the oil ports and the oil convoys along the coast of Syria and Palestine. Owing to the strategic position of the Dodecanese, the English in the eastern part of the Mediterranean are able to carry on only coastwise traffic protected from British flying fields in Syria and Palestine.

There is no noise of battle today about Rhodes and the Dodecanese. Nevertheless, the group of islands is ready to repel any attack, and the more so for the reason that, since the occupation of Greece and the Greek islands by the Axis powers, it no longer constitutes an outpost but is covered by Greece and the Greek islands in the rear and by Crete on the flank.

Antitank

[An article by Major Arthur E. Marshall in *The Fighting Forces* (Great Britain) June 1943.]

IT HAS BEEN suggested that the tank as a primary weapon is rapidly becoming obsolete; that the antitank gun and the mine have negatived it. Strangely enough, this theory was held to be true by many military experts before the war, and it appeared to be borne out, to some extent, by the experience during the Spanish Civil War. It is interesting to speculate what might have happened in France in 1940 had the Allied armies been plentifully supplied with a gun like the 6-pounder and had the French Army been imbued with a "Verdun" spirit. In Libya the German 88-mm gun, our own 25-pounder, and later 6-pounder, have had their moments, have made great killings; but if these killings are carefully analyzed it will be found that the results came from a coincidence of very good gun handling and very bad or at least indifferent tank handling. Nevertheless, it is fully recognized that the tank cannot initiate the attack against well-organized defenses which include antitank guns and minefields. In the last war the tanks' greatest successes were achieved when they led an attack which was preceded by the shortest of bombardments. Now it is first necessary for infantry and engineers to open a pathway across minefields and antitank ditches. Artillery barrages, dive-bombers, and even infantry are needed to neutralize the antitank gun. After this the tank can go in and do its job of killing and neutralizing infantry.

In these tactics the attacker requires an overwhelming concentration of men and materials such as General Montgomery produced at El Alamein and at Wadi Akarit north of Gabes; such as Rommel had previously failed to produce on the same battleground, and the Germans produced at Sevastopol but repeatedly failed to produce in front of Stalingrad.

However, it has not been proved that the tank is obsolete or even becoming obsolete as a primary weapon. What is certain is that it has definitely been relegated to its proper roles, i.e., the supporting arm to infantry in the attack against strong defenses, the main arm in the application of the *coup de grâce* and in the pursuit of a defeated force (not a force making a tactical withdrawal). It may also be the main arm in the deep exploitation of a penetration, but that will depend on the nature of the country and the quality and quantity of antitank defenses which are likely to be met.

These arguments will hold good so long as a small, easily concealed gun can be produced: a gun which will penetrate the heaviest armor that can be made mobile; the fundamental reasons being that concealment is and always has been a better protec-

tion than armor; that the observation from a closed armored vehicle is always bad (small arms will keep it closed) and seems to decrease in proportion to the increase in weight of armor.

These factors must be kept in the forefront when considering the tactical handling of antitank guns. It is absolutely essential that the antitank guns are not observed until they open fire and even then they should, despite their flash, only be seen by the targets they are actually engaging. Every antitank gunner, from the No. 5 to the regimental commander, every commander handling antitank guns, must appreciate the fact that it is concealment and observation which give the antitank gun the "edge" on its quarry, the tank. Forego these and the gun is easy meat for the tank, its supporting aircraft, guns, and infantry.

Provided the foregoing principles are clearly appreciated, the siting of individual guns, or troops and their vehicles, is not a difficult matter; the difficult problems are met on the battery and regimental levels.

It is of considerable assistance in getting these problems in their proper perspective if the fundamental role of the divisional antitank regiment is clearly understood. It is the antitank stiffening to the division's tactical base and pivot of maneuver. Together with the divisional mines, it forms the breakwaters which guide the waves of the enemy's armor, in attack and counterattack, into the area prepared for their destruction. Thirdly, it may be used simply as a step or tank barrier to prevent enemy penetration into the lane of an attack or advance. Then there is, of course, the defense of the "soft" [not armored] vehicles and the supply and maintenance of units of the division. It would seem from the foregoing, at first glance, that command of the regiment should be centralized if its guns are to be co-ordinated on a divisional plan. It has been generally recognized, however, that for various reasons this will not work, the principal of which are that the 6-pounder gun is a short-range, direct-laying weapon and must be sited within a defended locality. As it forms the skeleton or framework of the locality, and the whereabouts of the locality is largely dependent on the siting of the guns, it therefore follows that the locality commander must have complete control.

Next, the gun siting must be coordinated with the guns of the infantry antitank platoon, or platoons, in the locality. The only satisfactory solution to this is for the locality commander to allot responsibilities and give direction.

Also the gun team is susceptible to infiltration and must be protected. It therefore, for this reason also, must be sited within the infantry locality.

From the commencement of an operation, or earlier, batteries will be placed under the command of brigades and possibly troops [subdivisions of a

battery.—Ed.] under the command of battalions, either infantry or tanks.

This means that an infantry or tank unit commander will command his own six guns, either 2-pounder or 6-pounder, and four or more additional guns. He will be directly responsible for the manner in which the guns are employed. If they are to be used, especially the Royal Artillery guns, in a bold divisional plan of tank killing, these unit commanders must receive considerable training in their tactical handling. They must be fully in the mind of the divisional commander and be *au fait* with his particular ideas on antitank tactics. Finally they must know his complete antitank plan for any particular operation.

It is here that the good antitank battery commander will prove a most useful link between the divisional commander and the unit commander. He will get the divisional plan direct from his own regimental commander or the commander of the Royal Artillery and will be able to advise the unit commander. Theoretically he is, of course, the antitank adviser to the brigade commander and must be with the brigadier when necessary. Nevertheless, if he can manage to keep close liaison with the units to which his battery is deployed, he can be of inestimable value in ensuring that the divisional plan is being implemented.

The commander of the antitank regiment has to be prepared to advise his divisional commander on the divisional antitank layout. To do this he must have a clear picture of the divisional pattern on the ground both stationary and in movement; and its layout and extent in accordance with the current internal organization (i.e. whether the division is in brigade groups, whether tanks are separated or concentrated, and so on). He must know the exact location of each troop of his regiment [corresponds to our artillery battalion.—Ed.]. He must know the exact number of mines available and where they are. The latter point is necessary to enable him to calculate the time factor when he has decided where to put them. He should have trained himself to think of them in relation to the ground they deny; it will help to speed up his appreciation. He should know the latest information with regard to the enemy, particularly its armor. Finally, and most important, he must do everything within his power to know the ground over which the operations will or might take place. He must take every opportunity to study maps and photographs. Above all, he will make personal reconnaissance. Then when he has to produce a plan, or some aspect or criticism of one, it will be soundly based.

In his mind will be three clear patterns or pictures which will overlay each other and interlock.

First the base, which will be a pattern of the ground. This is fixed and unalterable. Next, there

is the pattern of the division, which is fluid and flexible within its limitations. This must be fitted to the ground about the key pattern of the antitank weapons, so that whether the division is a bastion or cluster of bastions holding vital ground, or a foothold from which its armor and infantry are striking offensively, its stance will be firm and well balanced like the body of a skilful boxer: ready in defense to block or evade and counter viciously: in attack to make ground easily and put everything behind the punch.

Employment of Artillery In the Mountains

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German review of the Russian book of the same title in *Artilleristische Rundschau*]

Mountains exhibit great differences in appearance and characteristics. The usual characteristics of mountains, intensely broken surface, great climatic differences, scant population, and paucity of roadways are emphasized. Mountain combat, more than other types of combat, requires shrewd and deliberate self-sufficiency. In the course of history, mountain fighting has continually increased in scope as far as the number of troops involved and importance of engagements are concerned. As in time of peace, so also in time of war, the bulk of the traffic, billets for the troops, rear services, and aviation installations are to be found in the valleys. Exploration of terrain in the mountains requires a great deal of time. For exploration for the use of the artillery it is necessary to climb to the summits. In spite of the broad, clear view, there are usually many dead areas [ground which can not be covered by fire from a position because of intervening obstacles.—Ed.] requiring careful consideration in all tactical operations. Success in modern mountain warfare is attained only by cooperation between forces operating in valleys and on the heights.

Both horse-drawn and motorized artillery can travel in the mountains. It is emphasized that motorization has increased the mobility of artillery and that it is not subject to fatigue resulting from long ascents. The employment of motorized artillery, however, is greatly dependent on the road conditions in the mountains.

The most serious problem is that of the mobility of the artillery. The problem of moving guns is most easily solved in the case of guns which can be broken down into several loads. This is the invaluable advantage presented by the mountain howitzer which can be thus disassembled. All additional help available must be utilized in moving ordinary field guns. For instance, oxen can occasionally be used for this purpose.

The movement of troops in the mountains is affected by the following factors:

1. Difficulties from the point of view of the command, when independent columns are separated a considerable distance and each of the separate columns is stretched out to a considerable extent.
2. Slowing down of the rate of march and fatigue of men and animals due to the climb.
3. Limitation in the use of motor vehicles.
4. Small number of routes.
5. Difficulties in supplying food for the columns.
6. Dependence of the troops on season, time of day, and weather conditions.
7. Necessity for maintaining march dispositions in accordance with tactical considerations.

Careful exploration of the available routes and a knowledge of their nature and passability is necessary in providing security on the march. Italian troops make this matter a frequent object of their exercises. Security must be taken into consideration in the disposal of troops in the march column. It is well known that on account of the heavy loads which have to be carried, mountain artillery travels somewhat more slowly than mountain infantry. The number of daylight hours should also be considered. A particularly long period is assigned for the long rest—for the artillery, three to four hours for all marches of over six hours.

The retention of fighting ability and the saving of strength in both man and animal is considered of great importance. Requisites for this: choosing the most suitable route of march, seeing to it that the proper amount of rest is received, care in the matter of food and water, proper march discipline, good equipment for both men and horses well adjusted to their bodies, and previous training for men and horses.

The difficulties in the way of a rapid deployment of forces for combat from a marching column, require a division of the column into numerous march groups. One of these march groups should not exceed a reinforced company, or a battery and engineer platoon. All possible routes, without regard to condition, should be used as soon as contact with the enemy is expected. In order to make the march easier, infantry and artillery should march separately wherever possible! In very steep stretches, when going down grade, the infantry overtakes the artillery, gradually works its way through it, mixing with the artillery pack animals. This is regarded as advantageous as it shortens the column, and in case of necessity the infantry is able to help the artillery in bad places.

Engineers should be sent ahead with the advance guard to get the road into condition.

Security

The following is required for sake of security:

1. Each group must be strong enough to be able to fight alone for a considerable time.

2. Effective security must be provided for the development of the main column which, on account of its great length, requires considerable time. A rifle regiment with two mountain batteries and a combat train, is about six miles in length and requires four or five hours to deploy.

3. Even small forces are able to hold up the progress of a column in the mountains. For this reason a few guns should be placed well forward. Engineers should be placed with the advanced security elements. Lateral protection is important: stationary or mobile scouting troops are stationed on the heights on both sides of the route of march, joining the column again as it passes.

It is one of the missions of artillery reconnaissance to see that the artillery functions at the proper time and in the proper manner. The equipping of reconnaissance and security detachments with communications apparatus is emphasized.

Defense in the Mountains

Mountain engagements which usually take place along the route of march are, as a rule, for the possession of passes. Natural obstacles strengthening defense are important. Watch out for areas where the enemy might assemble for attack. Take all possible advantage of difficulties the enemy may have in bringing his artillery into position. Prepare areas beforehand for one's own use in combat. Improve roads which must be used for the movements of one's own troops, fortify important positions, and bar the routes of the enemy to them. Stop the attack with a minimum of personnel and compel the enemy to remove barricades which are in the field of fire. With a part of one's forces, stop the enemy in a location previously decided on and send strong forces over previously planned routes against his flanks.

Where experience is lacking, one is inclined to overestimate strength and inaccessibility of defensive positions. The difficulty of the ascent and the broad view from the top produce an impression of special strength in the position. The fact, however, must be taken into account that this height is likewise open to view from many points and can be placed under fire by numerous enemy batteries; that it is difficult to conceal troops and rifle pits on the height; that the climb is hard for the reserve and requires a great deal of time; that in spite of the apparently fine field of fire, there are still many good routes of approach at dead angles.

The position should provide the possibilities of defense in all directions and the firing chart eliminate as many dead angles as possible. The history of war (World War I, Civil War in the Caucasus, etc.) gives many examples of successful overcoming of so-called "insurmountable obstacles."

At first thought it seems as if the matter of selection of observation posts for mountain artillery would present few difficulties. After receiving the

combat mission, the artillery commanders must decide on the areas for location of observation posts. In spite of the broad field of view there are, in the mountains, a great many sections of terrain hidden from view. Very high observation posts are often covered by clouds, others located lower down are blinded by the fogs in the valleys. It is necessary to have observation posts at various levels. The great breadth of defense requires a large number of observation posts, which in turn means a great deal of communications apparatus. The enemy is able to conceal himself behind rocks, in the low tree growth, and in rifle pits, making his detection very difficult for observation.

A: Concealed firing position of the battery.

a : Dead area for fire of battery A.

B: Position of the silent gun for covering dead space **a**.

b : Field of fire of the silent gun.

138

Fire control in the mountains is more difficult than under ordinary circumstances. It is influenced by the map at hand and existing conditions (formation of terrain and conditions affecting observation), and by the time available for preparation of the firing chart. Experience is required for orientation in the mountains. If the time is short and the terrain close, one has to be satisfied with a rapid determination of landmarks. The opening of fire should not be delayed by preparation of firing data. The establishment of several OP's is recommended for target reconnaissance, for not all targets are visible from one station. The observation crew requires a great deal of time; the stations should, as far as possible, be located at the same height.

Target designation follows as in flat country, by reference points or coordinates, vertical coordinates, as shown in panoramic sketches, also being given. For mutual orientation between infantry and artillery, panoramic sketches, on which targets or objectives and points in the terrain are marked, are valuable. Panoramic photographs are still better than panoramic sketches. In Morocco the French tried to replace maps by aerial photographs with a net-work of coordinates. It turned out, however, that aerial photographs were of little value to the artillery on account of vagueness of detail in the rough terrain.

In choosing a firing position, attention is called to the difficulties which arise on account of the great minimum angle of elevation, the limited space available in the firing position, and the differences in height between the various guns. The main negative factor of artillery positions in defense lies in the dead

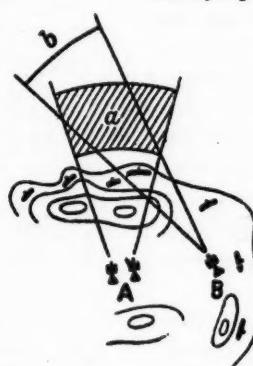
angles which can only be handled by suitable location of the battery, by flanking or oblique fire. Silent guns may be used for the combat of such dead areas in front of the main line of resistance (see sketch).

Special emphasis is placed on the self-defense of artillery in the mountains. There must be observation and defense in all directions.

The principal means of communication are by radio and by visual signaling apparatus. Good visibility permits the use of wig-wag signalling up to distances of 1,000 yards. The difficulties of laying cable for communication, on account of the great amount of wire required, are recognized. It is not always possible to lay double conductors.

The missions of artillery in defense are:

- a.** Destruction of the enemy.
- b.** Blocking of narrow passes, trails, ridges, and gorges.
- c.** Shelling of terrain which may be used as assembly areas.



The company commander orders barrage fire from batteries to which this mission is assigned. Gorges and areas of terrain which cannot be reached by the artillery are turned over to trench mortars and infantry weapons.

Long-range bombardment disturbs the enemy as they approach. Batteries are brought up to the lines of the outposts for this purpose. The fire is directed by the artillery spotting plane. Barrage areas are considerably more limited than in level terrain.

As a rule artillery is not handled as a unit but is distributed out to regiments and companies. Heavy artillery is used in combating enemy artillery and in reinforcing the artillery fire at the focal points of the defense.

Antitank defense is just as important in the mountains as in level terrain. The use of antitank formations is rendered difficult on account of the rough topography which prevents full utilization of their fire. Such terrain also hides movements of enemy tanks which may therefore appear suddenly close to the antitank unit.

Attack in the Mountains

The attacker dictates the rules of the encounter. The chances of success are increased in cases where the defender considers certain barriers impassable and does not fortify them but merely watches them. As an example the author cites the successful passage of the Russians across the Balkan mountains in 1877.

The course of operations depends on the nature of the particular section of the mountains in which they take place. Quite frequently the various units have no contact with one another and are not able to maintain direct, mutual support. They are forced to operate independently. Orders issued by the command and preparations for attack must take this

fact into account. Generally, the main objective is the capture of a ridge. This can only be accomplished by occupation of the heights commanding a pass. Usually, therefore, a frontal attack is carried out in connection with a flanking maneuver. The importance of combat reconnaissance is especially emphasized.

One of the missions of artillery reconnaissance is the exploration of the terrain for the initial assembly of the artillery, the firing positions, and the command posts.

In the mountains the infantry is supported in its attack by bombardment of successive objectives. The attack moves slowly. For this reason it is possible to discover and reduce enemy strong points at the proper moment. Close contact between infantry and artillery is necessary. It must be possible for the artillery assigned to the infantry to follow the latter in the mountainous terrain. For this, mountain artillery should be used as much as possible. The missions of the artillery in attack are the same as in level terrain. Enemy observation posts are difficult to locate, however, and enemy antiaircraft formations hard to combat.

During the World War, heavy artillery was used in attacks in the mountains. The French employed heavy howitzers also in the battle of Rifkabylen. Likewise the Italians in Abyssinia reinforced light mountain artillery by heavy howitzers, although the Abyssinians did not possess any artillery worth mentioning. It was possible to disassemble the 149-mm howitzer and make it up into several loads for transporting. Tanks have not reduced the importance of heavy artillery in the mountains.

Marshal Badoglio calls attention to the fact that artillery has often determined the outcome of battle, particularly when it was impossible to employ tanks on account of the unfavorable nature of the terrain. As an example the author cites the attack of the Italians at Adowa in October 1935, where the Abyssinians had their positions in a heavily wooded sector which made the employment of tanks impossible.

Ammunition Supply for Artillery

Even in level terrain the matter of ammunition supply is a worry for the command when the army is well equipped with artillery. It is easy to understand, therefore, that in mountain fighting difficulties along this line can arise. The most varied means of transportation are required for bringing forward artillery ammunition from railhead to pack animal. Even after great efforts to get the artillery in position, it is not always possible to keep it supplied with ammunition. It is then either necessary to reduce the number of firing guns or to be sparing with their ammunition. In pursuit operations the difficulties are increased. There is no advantage in transporting a great number of guns with but little

ammunition. Better results are to be had with fewer guns but a great deal of ammunition.

Skilful Use of Infantry Fire

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article in *Krasnaya Zvezda* 1 June 1943.]

Although indefinite in places, this article conveys the message of the importance of the plan of fires in small unit maneuvers, and the importance of flexible fire power as a command means in influencing the progress of the battle. The article is presented for the purpose of provoking thought on the subject.—THE EDITOR.

THE INFANTRY of the Soviet Army has a large number of varied fire elements. Their skilful employment during combat is absolutely obligatory on the part of every officer. War teaches that flexible fire maneuver almost always guarantees superiority in the most important sectors. With the aid of skilful maneuver of fire and weapons it is possible even with small forces to inflict powerful blows on the enemy and achieve success. Finally, fire maneuver permits increasing the pressure on the enemy or intensifying resistance against him, regardless of losses suffered in the course of the fighting.

The art of maneuvering infantry fire consists in the ability to mass fire rapidly in decisive directions and sectors. This is the more easily accomplished, the better the preparation and the more thorough the plan of the operation from its initial stage. But of course not everything can be foreseen in the plan. For this reason the commander must necessarily be aware of the course of developing events, must unremittingly evaluate the changes occurring in the combat situations, and must react to these changes promptly. Uninterrupted control of fire is the first consideration in any successful maneuver.

During recent fighting one of our infantry battalions was pinned down under enemy machine guns which suddenly opened fire on the flank. Up to that time the battalion had been advancing in good order. It had already captured two lines of German trenches, and, rushing forward, it began to advance farther. Battalion and regimental mortars, cannon, and regimental artillery had already shifted fire into the enemy rear but the riflemen could not move from the place. The fire of machine gun dugouts pinned them to the ground. It turned out that the battalion commander could not silence the enemy firing points because he had lost control of fire in the course of the battle. As soon as the troops started to move and the progress of the battle made it necessary for the commander to shift his command post forward, he lost liaison with the attached artillery and even

with his own strongest fire elements. Small caliber guns, mortars of medium caliber, and machine-gun platoons were firing, carrying out the tasks previously assigned, and acting on the basis of the situation as it developed in their own sector without regard to the interests of the battalion as a whole. Naturally under such conditions the battalion commander could not put flexible fire maneuver into effect. Any success noted at this place was not promptly supported by fire and did not receive proper development.

The maneuver of fire and fire elements is inseparable from precise and skilful control. Only that commander knows how to concentrate fire in decisive directions and sectors who has learned to dispose his fire elements correctly in the terrain, to assign them exact tasks, and to maintain constant liaison with them and impose his will on them.

Maneuver and a set pattern are incompatible. If the commander planning the battle anticipates that he will have to concentrate fire on a certain spot but the situation later demands that the fire be concentrated elsewhere, it is necessary to be able to make the shift immediately. If, in solving a problem in the main sector, certain fire elements have not been able to bring it to completion and the situation demands immediate annihilation of the enemy, then the commander must know how to reinforce these fire elements at once at the expense of another, secondary, sector. Skilful fire maneuvering is the speedy concentration on the enemy of the power of weapons sufficient to secure the successful conclusion of the combat.

Bold movement forward of machine guns, mortars, and small-caliber guns, especially in attack, gives the possibility of maneuvering them and their fire with the greatest speed. This secures the maximum and simultaneous employment in combat of all the infantry fire elements from the beginning to the end of the battle. In such a situation the commander has the possibility of quickly concentrating fire at the place where success is noted or where the enemy is attacking, and of subjecting the enemy to unexpected fire from the flanks and rear, thus disorganizing his combat formations and accelerating the course of events.

In the course of battle, when the line of the forward edge has a zigzag form, any gun suddenly appearing on the flank or rear of the enemy can make the solution of the problem much easier and produce a great effect. This is why the commander must boldly move the most mobile fire elements through the breaches and gaps opening up, and quickly organize fire from new positions. One of our units, attacking the Germans on a sector some 300 to 400 meters in width, moved one kilometer forward. The wedge was very narrow, and it seemed that the enemy, reinforced by tanks, was about to crush it. But the commander of the unit of combined arms had

moved up several light guns and heavy machine guns just behind the first infantry skirmishers. As a result, the enemy counterattack was not only beaten off, but staggering blows were dealt at the most sensitive places of the enemy position. The unexpected appearance of powerful weapons on the German flanks and in their rear forced the enemy to roll back also in neighboring sectors. Thus the bold maneuvering of guns and mortars produced an opportunity to develop the success quickly and to gain victory over the enemy at this place.

The commander must know how to get all the fire power from the means at his disposal. This is attained by effective use of all types of weapons. When, for example, the target may be crushed by a light machine gun, a heavy one should certainly not be used for the purpose. Indeed, such generosity might prove to be harmful, for the heavy machine guns, forced to substitute for light machine guns or tommy guns, are diverted from the performance of tasks appropriate for them alone. This might involve also the necessity of rearranging the work of the mortar and artillery personnel. The whole scheme of the utilization of infantry weapons in combat might thus be disrupted, complicating the maneuver of units, weakening their fire power, and requiring the premature call for the fire of supporting elements. Combat practice thus testifies that only that infantry commander attains success who first of all makes use of infantry weapons correctly and with maximum effectiveness, and has recourse only on necessary occasions to the support of guns and mortars assigned to him.

Skilful maneuver of infantry fire is an indispensable condition for success in combat. Having secured uninterrupted control of fire means, it is possible to maneuver gun fire and weapons boldly and decisively and to make use of the full power of the infantry's arms.

Developments In Tank Warfare

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Emskötter in *Völkischer Beobachter* 14 May 1943.]

WHEN THE CRY "Tanks!" is heard on the battlefields of this war it still produces its peculiarly startling effects, just as it did on the battlefields of the first World War. Today, however, there are no longer any grounds for speaking of a panicky effect on the infantry, for those who have gone through several attacks by these monsters remain quite cool. To be sure, all become more alert and tense, but not so much because of the approach of the tanks themselves as on account of the fact that a tank attack almost always heralds greater enemy activity. And

so, to the soldier of 1943, the cry "Tanks!" means the same as "Look out! The enemy is coming!"

From this we may perceive that the concept "tank" is inseparably connected with the concept of "war of movement." The thought will occur that this is self-evident since the tank is a vehicle. But this conclusion is true only in a limited way, for it is not the employment of the tank in itself but the operational employment of the tank that has had a revolutionary effect on war. To be sure, when tanks are engaged in smaller units against enemy positions they are able to effect breakthroughs and maintain them for a while. The maintenance of such a situation for longer periods, however, or the extension of the breakthrough with the production of a flowing movement on the part of the enemy without committing considerable numerical strength and without accompanying fast [i.e. motorized] infantry, are most unusual occurrences.

The German armed forces were the first in the world to recognize this fundamental law of modern tank employment and for this reason connected their tank divisions as intimately as possible with motorized rifle [infantry] regiments (the present tank grenadier regiments) and motorcycle troops which then, as powerful assault armies, really succeeded in effecting bold breakthroughs into the heart of the enemy's armies. These actions were of decisive significance in the general course of operations. All the famous "Kessel" operations since 1939 took place in this manner; breakthrough, assault wedge, encirclement, annihilation. In 1941 the Soviets distributed their tanks uniformly among their infantry divisions for reinforcement, each possessing from 80 to 100 of them as attached weapons. They thought they had made a great discovery, but the course of the campaign soon showed the superiority of the German method of employment and threatened to break down the resistance of the Soviet giant in spite of his numerical superiority.

The first winter in the eastern theater of operations limited the German advance and permitted the Bolsheviks to alter their organization and copy our strategy. Out of their gigantic reserves they organized assault armies which, in conformity with their typical manner of thinking, they equipped with enormous masses of tanks for the purpose of outdoing the Germans.

A great danger had arisen for Germany. And so Germany equipped herself to stop the Soviet counteroffensive, to ward off the assault from the steppes. The campaign on the eastern front entered a second phase. After this, many major Bolshevik offensives and attempts at a breakthrough over small sectors or broad fronts were warded off in spite of the enormous massing of the enemy's artillery, tanks, and infantry. Although the enemy succeeded partially as the result of reckless sacrifice of men and material aided by favorable climatic conditions,

he did not attain the desired strategic decision. Repeatedly the German grenadier was able to stop the advancing tank columns and assault wedges and by means of elastic withdrawing movements, counter-thrusts, or a firm stand bring to naught all the dreams of the Soviet marshals of crushing our front. The Bolsheviks were able to chalk up to their credit a few gains with fearful losses of blood.

We have said that the tank arm can be a decisive factor in the mobility of warfare. This becomes true when (1) the tank is correctly employed, (2) the terrain is solid enough to bear its weight, (3) the tank crews are of the proper mettle, and (4) the defense is not stronger. A few more words with regard to this fourth point:

The counter weapons have also developed along with the tank. The stronger the armor of the tanks, the larger became the calibers of the antitank weapons. It will be reserved for a later time to make comparisons. But there is one thing that can be said: German antitank defense has been so developed that up to the present time it has not only kept pace with the development of enemy tanks but has even gone a considerable distance beyond them. There have been, without any doubt, many enemy tanks that have been hard to combat but as yet not one that was invulnerable for our defensive weapons.

Fighting In Burma

[From an article dated 15 June in *The Statesman*, Delhi, India, 23 June 1943.]

I HAVE just returned from a visit to the Chin Hills front where there has been no activity beyond patrolling during the past fortnight. The Jap has made no further attempt at an advance along the Kalemyo-Fort White road. British forces have watched him in the territory he has so far won. The only explanation of the Jap's quiescence is that he got a severe mauling in the fighting which took place at the end of last month.

The story of this fighting bears retelling. When the Japs first attacked they outnumbered our troops' screen by at least ten to one. The Gurkhas, though outmanned and outgunned, tenaciously stood their ground and inflicted heavy casualties on the enemy as he attacked in wave after wave, and they broke off the fight only when ammunition was critically low. Allied reinforcements were immediately rushed to slow down the Jap advance, but in numbers they were small. Nevertheless, though outnumbered and without air or artillery support, they launched a furious attack and inflicted four to one casualties on the enemy before hurling him off a commanding hill which they had ultimately to abandon only because the Jap still commanded with mortar and artillery the hilltop his men had been unable to hold.

But the assault had achieved its purpose. The Jap

FOREIGN MILITARY DIGESTS

advance thereafter was hesitant and cautious till he reached Fort White whence he quickly withdrew back to the battleground where he had taken a drubbing.

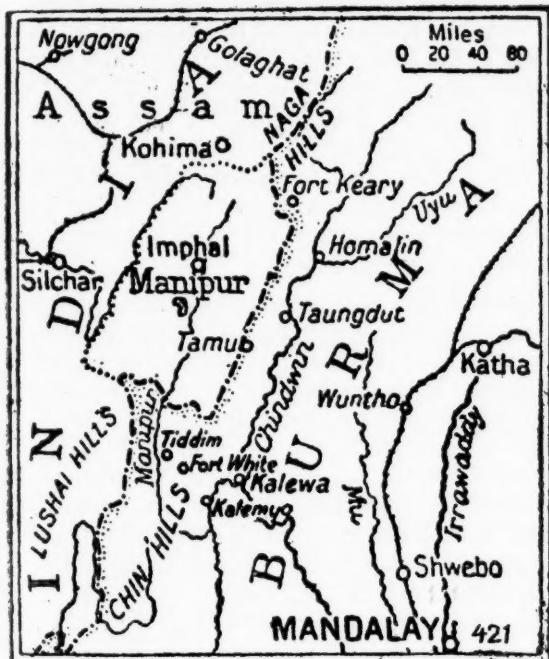
The reasons for the Allied success were two: first, the Gurkha is a berserk fighter: he showed an indomitable will to win. Here are examples: one company, ousted from its position after a terrific fight against great odds, marched 42 miles over the most mountainous country in 27 hours and then without rest led a new attack against the enemy. One Gurkha

monarch of the Chin range, I looked down on territory where the fighting took place last month.

The outstanding impression was the gigantic size of the arena in which the war is being fought here. Troops have not only to march dozens of miles to get anywhere but also to climb or descend thousands of feet. The war here puts a new emphasis on the toughness of men; on lines of communication which feed the forward troops. Roads that stretch more than 300 miles through mountain fastnesses almost to the front must be the most picturesque lines of supply in the world. How these roads—sometimes a generous highway carved out of a steeply sloping mountain, sometimes no more than a path hand-hewn in the face of rocky precipitous cliff—have been contrived and are maintained, only the engineers know. How they carry the enormous amount of supplies they do is a secret confined to the Supply Corps.

Indian drivers here are doing a man-sized job. To ride beside them as they set their vehicles at a hill, sway, slither, and buck to the top, as they negotiate hairpin bends with uncanny skill and put their machines through axle-deep road bogs is an experience not to be forgotten easily. The most mechanical contrivance these men knew before they turned drivers was a plough. The training of drivers in the Indian Army has in the past left much to be desired but these men who bridge the Assam-Burma border with supplies are veterans who have won through in the hard school of experience.

Now accidents are few and far between. But hazard and possible disaster ever hide around every corner. These only vigilance can meet, skill avert, and plain guts endure. The Indian drivers working there (half of them Madrassis) have them all in large measure. They have, too, the vehicles to back their endeavor, the aptly named "double-bug" and the incredible jeep.



alone killed seven Japs in a tremendous hand-to-hand melee, dispatching the last by using his light machine gun like a club.

The second reason for the Allied success was the employment of jungle fighting tactics known as "blitz attack." The Gurkhas like fighting at close quarters. Advancing before a screen of covering machine-gun fire, they spray the jungle with tommy guns and rifles fired from the hip. This keeps Jap heads down and cuts down retaliatory fire. Such tactics make up to some extent for lack of close artillery support. In last month's fighting they looked like the answer to Jap methods of jungle attack and defense, for though the enemy used the Kalemyo-Fort White road for bringing up artillery and supplies, he attacked along the jungle ridge and subsequently tried abortively to defend his jungled hill-top position.

The Gurkhas have all the more reason to rejoice because the crack Jap troops they mauled are old enemies with whom they had several bloody clashes in the first Burma campaign. Their slogan now is "Revenge in the hills." Their morale today augurs well for future fighting in this theater.

Yesterday from Kennedy Peak, 9,000-foot-high

A Duel with a Soviet Tank

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Lieutenant Würzburg, German Army, in *Hamburger Fremdenblatt* 7 April 1943.]

"LIEUTENANT, the commander wants you!" I reported to my company commander who was just returning from the battalion. "Drive to the village over there with a medium antitank gun. Report to the major and you will be attached to his battalion. The battalion has encountered a T-34 [Russian tank] which is causing a good deal of trouble. *Bon voyage* and good luck, old chap!"

A quick handshake and I was off. The sturdy prime mover rattled and lurched through the deep

snow, easily surmounting snowdrifts, holes, hollows, craters, trenches, and rises, which we took at full speed. In front, on the sides, and behind us shells were bursting; a tank was firing wildly from somewhere. In the snow behind us danced the swirls of hostile machine-gun fire.

I reported to the battalion. The commander quickly explained the situation and told me my mission. The gun was to go into position at the west end of the village. We swung up onto our machine and moved along.

The village was totally shot up. Only a few houses were undamaged. In them were resting and waiting the reliefs of the security patrols who were watching for the enemy behind their machine guns, mortars, and guns. For two days the Russians had attacked from morning to evening, stubbornly and recklessly, but again and again they had been beaten back, their dead lying in heaps and piles in front of the first houses of the village.

We rolled slowly and carefully past the houses on the right-hand side of the street. Thus we could not be observed from the right front. The street had a melancholy aspect. Above the ruins of the houses rose grayish-blue smoke from charring beams and boards, while yellowish fumes of smoldering straw came from the smashed and battered roofs. Dead civilians lay between broken mud walls, dead cattle in the burned sheds.

We crossed the street toward the left to take cover in a house. In a trice the gun was unlimbered and brought into position between two manure heaps. The enemy did not seem to have noticed it; at any rate, he did not fire. I had a rifleman point out the enemy tank to me: "Yes, sir, the tank is up there behind the red house. A half hour ago it moved in from the left behind the house." I ordered tank shells to be loaded and aim to be taken on the left corner of the house. Range, 300 meters. Two men remained with the gun. The others disappeared in the house behind it.

For a while everything was quiet; then some men dashed to the left in the direction of the large schoolhouse in which the Russians had established themselves the evening before. The movements became more lively. Whole groups ran, crouched over, toward the left and disappeared behind the school. Our riflemen harassed them with quick shots and hammering bursts of fire. There was a quick reply. Rifle shots whistled close over our heads and slapped against the mud walls just below us. Those fellows could not be far away! A mortar banged to our left rear. That too! We understood! Things were about to happen!

Then a motor roared. Watch! Perhaps the tank is now starting up!

Behind the house a long gun barrel moved to the left. Things were starting! It was coming! Slowly the tank rolled to the left. It skilfully took advantage

of a depression so that only the turret was visible. I gave the order to fire. The first shot sounded. A hit on the turret! Then the tank disappeared behind a gray barn. We knew those tricks! We weren't born yesterday! If he wouldn't come out, we would just shoot the barn down! A roaring discharge! Over there gray-black dust flew up, stones tumbled down. A hole yawned in the wall but nothing moved. We tried it again. The wall collapsed with a crash as if struck by a giant hammer.

Now watch! Will he attack? The motor is roaring. A dirty-white, camouflaged monster moves slowly to the right and turns its turret threateningly at us. We expect a shot immediately! But, remarkably enough, he does not fire. Then it is our turn! The next projectile leaves the gun. A hit! The tank stops. Now certainly it will fire! Then suddenly the hatch on the turret opens; two, three men climb out with cat-like quickness, and run to cover behind the house. The riflemen and my crew roar with laughter despite the dangers surrounding us!

Mortar shells were coming dangerously close, machine guns were hammering, rifles cracking. The fire steadily grew. Groups of the enemy ran to the left behind the large schoolhouse, followed by our fire. That was all just too stupid for us. Now we aimed at the schoolhouse and threw three shots right into the middle of the building so that it fairly cracked and wobbled. Then two shots on the ruined barn which served the enemy as a springboard to the schoolhouse; and now some shots on the red house from behind which they kept on rushing out in herds. That caused confusion and gave us a breathing space.

Now things were strangely quiet in front of us. We heard shots and the rattle of German machine guns far to the left. This was the turning point! The attack of a battalion coming to our assistance was striking in the midst of the hostile assembly area. It cleared up the situation in a short time, and the enemy moved off to the north at nightfall.

Before us in the gardens and bushes lay brown figures in rags and ripped overcoats, and over by the red house stood a deserted tank with open turret hatch, on which my men were soon climbing.

Debarkation and Engagement of a Naval Landing Party

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Senior Lieutenant N. Starshinov, Red Army, in *Krasnaya Zvezda* 30 May 1943.]

THE DEBARCATION of a landing party on a shore occupied and organized by the enemy for defense is a complex combat operation involving great risk. The members of a landing party must, before embarking,

undergo a prolonged and varied training under conditions as nearly similar as possible to those under which they are to fulfil their combat task.

In preparing a certain landing detachment, we worked out literally every step in the course of a long period, starting with embarkation and ending with the activities of the individual soldier as a member of an assault group when the fighting shifts to the rear of hostile defense. We established the training area on the seacoast. The soldiers learned to climb rope ladders, to take their positions in the ship, and to leave the ship by rope ladders and by swimming. It is very important for each soldier to know his place, and the duties on landing should be carefully assigned. If the soldiers do not know who is to throw out the rope ladders and the order in which they are to leave the ship, complete confusion may result during a night landing.

During preparation it is very important to determine what type of vessel is best suited to carry out night landing of the party on the hostile shore. Experience shows that small boats (cutters, motor-boats) are best for this purpose. First, they can come right up to the shore, and second, landing is more easily effected from them, which is especially important as every minute is extremely valuable in a hurried landing operation.

For convenience of exercising command in combat on the hostile shore, the landing party should be split up in small combat groups. When the landing party is transported on small vessels, a single landing group is usually carried on each cutter. When approaching shore, the cutters line up in such a way that each group on landing keeps closely to its assigned direction. The armament of the soldiers accomplishing the first landing for seizing a beachhead on the hostile shore must be light.

But it would be naive to think that a lightly armed party, even if suddenly landed under the cover of darkness, could independently break the line of hostile shore fortifications without artillery fire support. Instances are known when landing troops sent for reconnaissance purposes could not even land and penetrate the enemy positions simply because they were poorly supported by artillery fire.

In landing a party on a distant seacoast, the detachment must have artillery support from the ships; in landing on the opposite shore of a strait, coast artillery may give support to the detachment, as has been already proved by combat experience. As in the first, so also in the second case it is necessary to coordinate precisely the activities of the landing party with the artillery as to time element and rate of advance.

How will this appear in practice? The artillery works on the hostile coast defense while the party in small boats is about 30 minutes' travel from the shore. As soon as the landing party is within 300 to

400 meters of the shore (that is, when it needs no more than ten minutes to reach shore and disembark), the artillery shifts its fire to the next line of enemy positions, the rear of the hostile defense. It is clear that the enemy, stunned by the artillery bombardment, will not recover within this period of time and the party will not encounter organized resistance on landing. The effect of artillery fire on the successive lines of hostile defense makes it easier for the landing party to expand the seized area.

In determining the extent of the artillery support for the landing party, it must be remembered that the task is not to crush the hostile defense along the narrow sector at the place where the party is to land. Rather, it is necessary to conceal the actual place of landing, and for this the artillery preparation is organized on a wider front. At the same time the artillermen fire on the command posts of the coastal defense. This disorganizes the command of hostile troops and thus weakens their ability to resist. In order to maintain close contact with the landing party, the artillery sends out advanced observers with it. These observers on the hostile shore direct the fire of batteries and individual guns by radio, designating their targets.

The commander preparing the landing party for action must accurately determine the direction of movement of each combat group after landing on the hostile shore and indicate what enemy position it must reach.

An example of skilful direction of combat groups in the seizure of definite positions was given by Major Kunikov. The region where Kunikov's detachment had to attack the German defense from the sea was familiar to the landing party commander and to many of the members of the party. They were further aided by the study of a map of the terrain and a diagram of an inhabited place. As a result each group was given definite march-route directions. The soldiers had a clear idea of the forward edge of the German shore defense in this area, but the commander did not have available the exact reconnaissance data on the enemy firing positions within the inhabited place. Therefore, sending a group in a certain direction, he assigned to them the task of destroying all centers of resistance along the way right up to the position where the group was to consolidate.

Major Kunikov made a thorough study of the problems of liaison within the combat groups and of problems of command during combat on the hostile shore. He saw to it that every soldier could recognize his commander's voice at night. Using light signals the soldiers and officers of platoons could easily determine the position of the group commander, the direction of movement, and the beginning of the assault on enemy strong points. In order to forestall confusion, the officers combined visible signals with sound.

MILITARY REVIEW

Many night landing operations proved that in combat activity on the hostile shore the following system is best for command and liaison within the landing party: The platoon commander directs by voice, the group commander directs the platoons with rockets and whistle, and the landing party commander maintains contact with the combat groups by runners. One runner is with the group, the other with the landing party commander. This assures rapid transmission of orders from the senior commander and of reports from the subordinates.

In addition to the combat groups which are to break through the hostile coastal defense in pre-determined directions, the landing party commander has a mobile reserve group at his disposal. Its mis-

sion is to parry possible hostile counterattacks and to destroy enemy firing positions remaining after the advance of the combat groups. The landing party commander also uses the reserves in places where the enemy displays particularly stubborn resistance.

When the advance landing party seizes an area sufficient for the development of further attack, it must be given time to consolidate the captured beachhead. This consolidation is best carried on under cover of strong fire by friendly coastal or naval artillery. It is imperative that, simultaneously with the consolidation of the beachhead, fresh units of infantry with tanks and artillery be brought to the captured coastal strip the same or the following night.

The recent Orientation Issue of the Special Service Digest affords excellent material for the many officers of the Army who include orientation activities among their regular duties. Articles on "Mental Fitness for Combat" (reprinted in this issue of the MILITARY REVIEW), "How to Organize for Orientation," "How to Conduct an Orientation Hour," and "How to Set Up an Orientation 'Center,'" provide suggestions for the solution of problems that will arise in many units. Other titles of interest are: "How to Get Daily War News to Troops," "How to Dramatize 'Why We Fight,'" and "Psychology for the Fighting Man."

The Special Service Digest, Orientation Issue, is available on request to the Director, Special Service Division, Army Service Forces, The Pentagon, Washington 25, D.C.



MILITARY NOTES AROUND THE WORLD



ITALY

Small-arms Equipment:

Italian small arms rate lowest among those standardized by any of 1943's major belligerents.

The majority of Italian fighters carry the obsolete 6.5-mm Mannlicher-Carcano rifle adopted in 1891. It is long and unwieldy—five feet two-and-a-half inches with its bayonet nearly a foot long, its barrel being 30 $\frac{3}{4}$ inches.

Two models of carbine are in common use, both identical in essentials with the long 1891 Carcano, the main differences being in the stocks and bayonets.

The Italians have a relatively new automatic rifle of which little is known, the 6.5-mm Revelli with a weight of about nine pounds and a rate of fire of 40 rounds per minute.

All of these arms use the rimless 6.5-mm (.256 caliber) cartridge which has remained standard with the Italians for over half a century. The bullet is a long, round-nosed projectile of 161.8 grains. Velocity is relatively low, about 2,300 feet per second. The high sectional density of the bullet is a point in its favor; such a long (1.182 inch), heavy bullet holds its energy and punch well over much of its maximum range. Muzzle energy of the Italian 6.5 is rated at 1,925 foot pounds, and its maximum accurate range in the neighborhood of 800 to 1,000 yards. The charge in recent loadings is 34.5 grains of a coarse cordite-type powder.

Italian handguns closely parallel the none-too-good rifles and carbines. The Bodeo 1889 service revolver, upon which some troops, notably machine-gun squads, must rely for incidental protection, is a clumsy double-action affair firing a 10.35-mm (.41 caliber) cartridge. It is over nine inches long and has a six-round cylinder which does not swing out for loading. Empties have to be rammed out one by one! Other Italian revolvers are little better than the Bodeo.

Two basic models of self-loading pistol are used in the Italian land forces, the Glisenti and Beretta, both firing a short 9-mm pistol cartridge. The action of the Glisenti is one of the most curious to be found in a military pistol. Barrel and bolt, which are definitely locked at the instant of fire, recoil together until

a swinging block is released from the bolt, which then continues its rearward travel alone to eject the empty case and pick up a live round. Between 1903 and 1911 it was submitted for U.S. tests but was considered so lacking in merit that an actual trial was never made. The Beretta is a conventional autoloader designed purely for military use. Until recently at least it had not been officially adopted by the Italian Army, though both officers and noncoms prefer it to the impossible Glisenti. It is notable for its small size, six inches overall, and its extreme simplicity. The 1934 model weighs only a pound and a half.

Far more potent 9-mm arms are the Italian sub-machine guns or "machine pistols." In 1938 a new model of the Beretta machine pistol was adopted, a straight blowback with a perforated barrel-guard and compensator, a miniature knife-bayonet of ordinary type, and two triggers, the forward one for releasing single shots and the rear one for full auto fire. A beautifully finished arm, the 1938 Beretta is in appearance at least one of the best of Italy's generally second-rate weapons.

(From *The American Rifleman*, July 1943)

GERMANY

German Tanks:

Hitlerite Germany originally figured on a lightning war. This was reflected in the construction of the tank forces of the German army. In preparation for the war the Germans produced light tanks of types T-1 and T-2 in mass. They had somewhat fewer medium tanks of types T-3 and T-4 at the start of the war.

In the first year of the war with the Soviet Union the Germans suffered great losses in tank material. Soviet tanks and armament proved better than the Germans had expected. In the course of the war, therefore, they hurriedly began to re-arm their tank forces. In 1942 they began to take out of production the light types T-1 and T-2 which had light armor (10 to 25-mm) and weak armaments (20-mm guns). There was an increase in the production of medium tanks of types T-3 and T-4 with modernized armament (long-barreled 50-mm and 75-mm guns). According to data at hand, the production of tanks in

Germany in 1942 was as follows: 60% medium tanks of types T-3 and T-4; 25% light tanks of type T-2 and the Czechoslovakian 38t and 35t; 15% heavy tanks. At the same time the Germans went into production of new heavy tanks with more powerful armament than the medium tanks and with increased thickness of armor. To this class belongs the tank of type T-VI which has recently attracted world-wide attention as the "Tiger" tank.

(*Krasnaya Zvezda*, 6 June 1943)

GREAT BRITAIN

World's Largest Tugs:

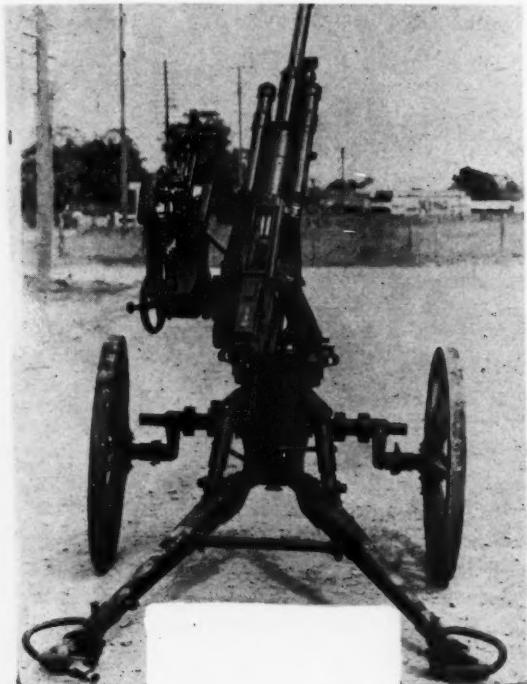
Fast, well armed, and capable of going hundreds of miles out to sea, the world's largest tugs are being built for the Royal Navy in British shipyards. They can tow anything from a battleship to a huge passenger liner. Their wartime job is to pull torpedoed or damaged vessels to safety.

Almost equal in tonnage to a medium sized destroyer, these tugs can put to sea on five minutes' notice. They are equipped with the latest devices: electric power from a dynamo works the winches, capstans, and other gear; fire-fighting jets throw liquid chemical extinguishers as much as sixty feet; and powerful pumps can clear a flooded hold in a short time.

(*San Francisco Examiner*)

JAPAN

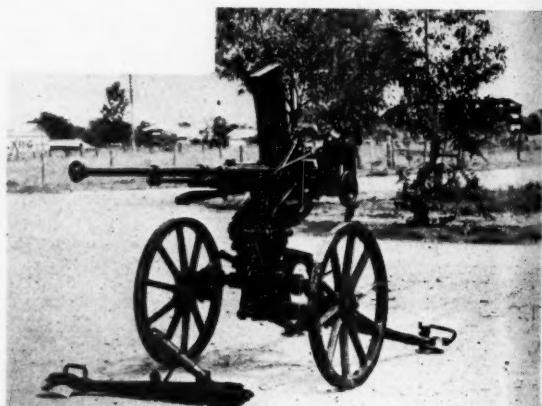
The 20-mm Dual-Purpose Gun:



20-mm dual-purpose gun, showing split trail, magazine, and sight.



20-mm dual-purpose gun in antiaircraft firing position. Can be depressed to fire at tanks. Oerlikon type. Muzzle velocity, 2,720 feet per second. Vertical range, 12,000 feet. Horizontal range, 5,450 yards. Magazine capacity, 20 rounds.



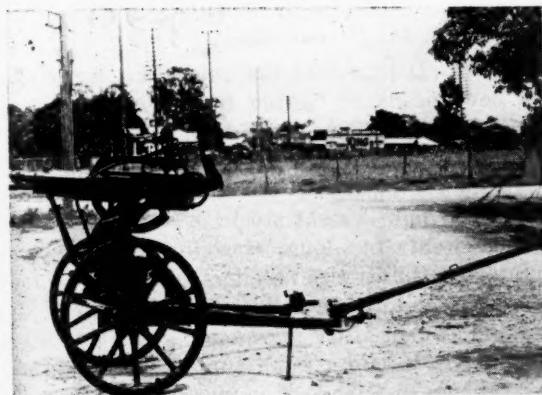
20-mm dual-purpose gun in firing position. Third trail off, resting on wheel.



20-mm dual-purpose gun in firing position with wheels up.



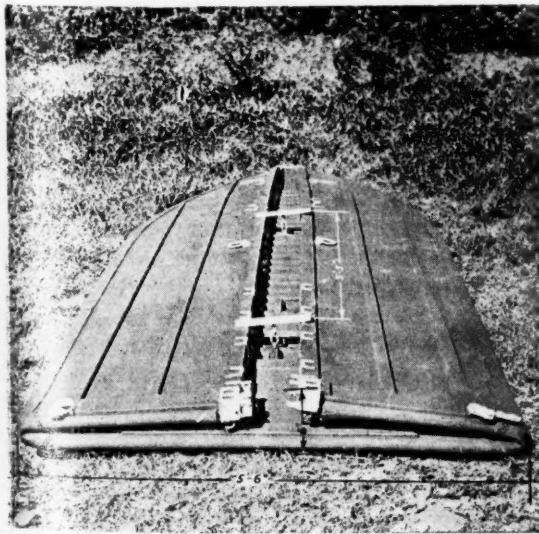
20-mm dual-purpose gun. Towing position with trails locked.



20-mm dual-purpose gun. Towing position with horse shaft.

Landing Craft:

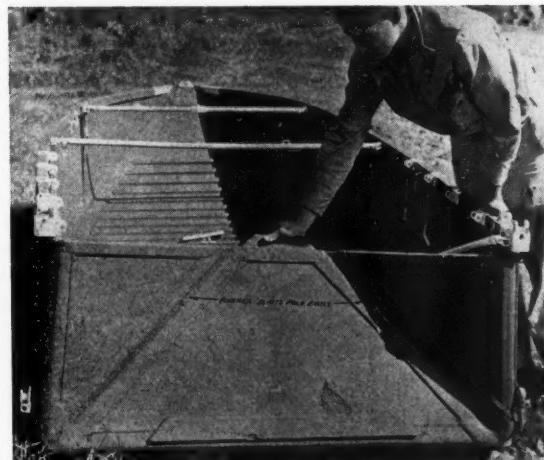
The following photographs show a Japanese collapsible assault and pontoon boat and the way in which it is manipulated.



The boat is completely folded for transportation.



The boat being assembled for use.



Detail view of the stern assembly.



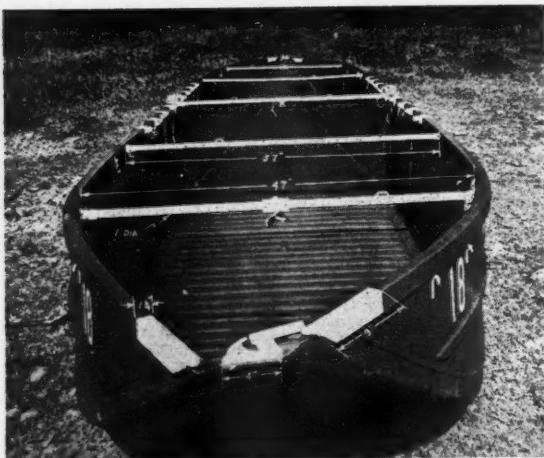
Two boats are joined by means of a special connection.

U.S.S.R.

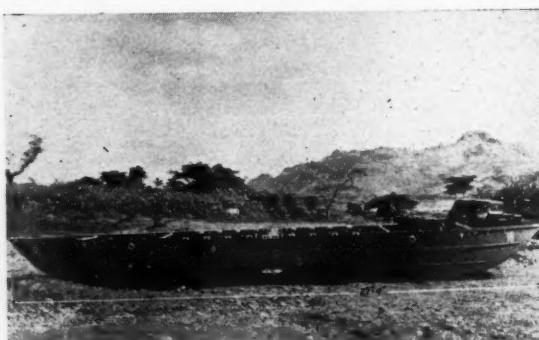
Russian Six-wheeled Armored Scouting Car:

An armored scouting car weighing seven tons is being used. It is armed with a 3.7-cm cannon and one machine gun in the revolving turret, as well as one machine gun pointing forward. The 85 H. P. motor permits a maximum speed of 70 kilometers per hour. Caterpillar treads may be fitted to the rear wheels to increase its cross-country traveling ability. Length, 5 meters; width, 1.92 meters; height 2.4 meters.

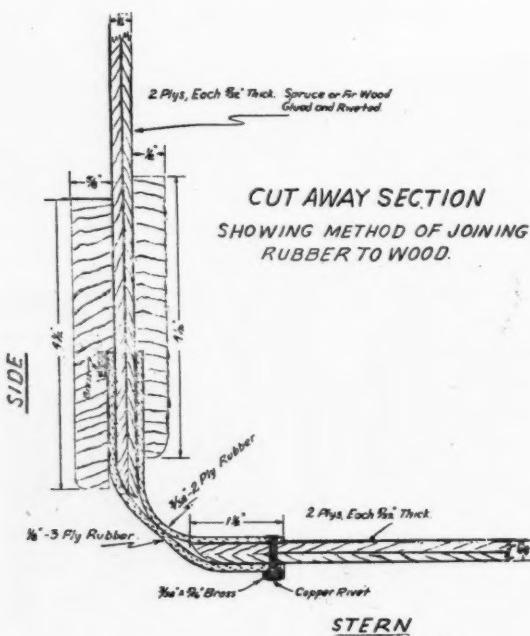
(*Die Panzertruppe*)



Front view of completely assembled boat (two boats fastened together) in full readiness for use.



Side view of two boats fastened together in readiness for use.



This diagram shows the method of joining rubber to wood to make the flexible joints.

UNITED STATES

Pipe Lines to the Combat Zone:

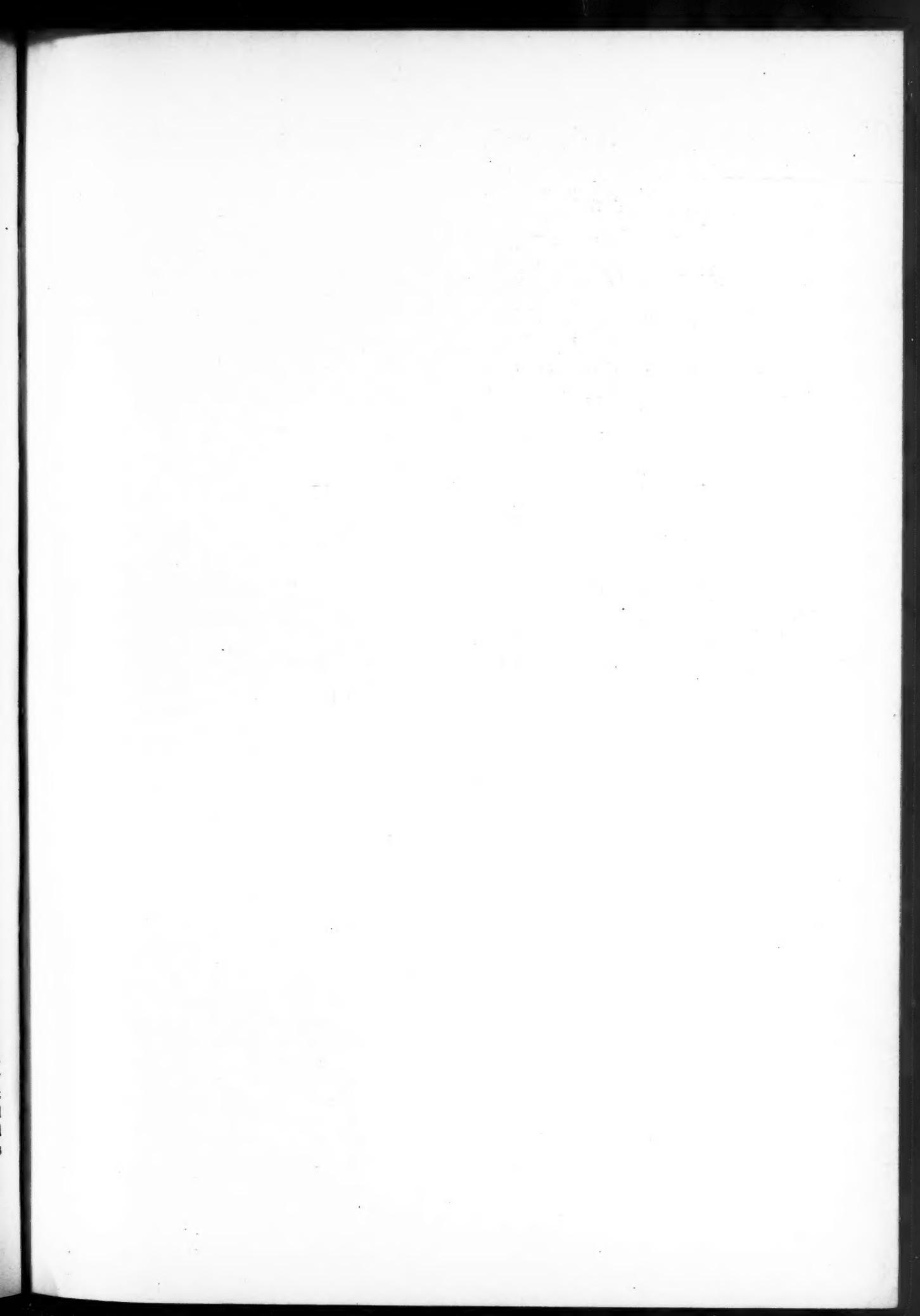
The War Department has released a description of a new means of fueling tanks and vehicles of war during an advance into enemy territory. It is said to have been used both in the Tunisian and in the Sicilian campaigns. It consists of a four-inch pipe line of light-weight steel made in standardized sections twenty feet long. Gasoline-powered pumps mounted on rubber-tired trailers keep the fuel moving. The pipe line can deliver 6,000 barrels of oil a day, and can be used for oil or water as well as gasoline. It is laid on the surface of the ground very rapidly, and while it is vulnerable to bombing it can be quickly and easily repaired. It is reported that eight or ten men can lay two miles of this pipe line in a day.

(*News Report*)

Cargo Planes:

Last year the Army contracted for the production of large numbers of wooden cargo planes carrying a maximum of 4,500 pounds of cargo at medium ranges, and designed to operate from small and unimproved landing fields. It now appears, however, that the Army favors the metal cargo plane over that made of wood. Various reasons for this are indicated. Experience with experimental models has established that the wooden planes are more expensive and less efficient than those now being manufactured of metal. The production of strategic metals has greatly increased during the past year and now promises to be adequate for the manufacture of metal planes, while there has developed a shortage of the kinds of woods best adapted for wooden-plane construction. Finally, the present need is for cargo planes with longer range and greater carrying capacity, and the Army has found itself, even in the combat zones, with landing fields adequate for the operation of faster planes.

(*News Report*)





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